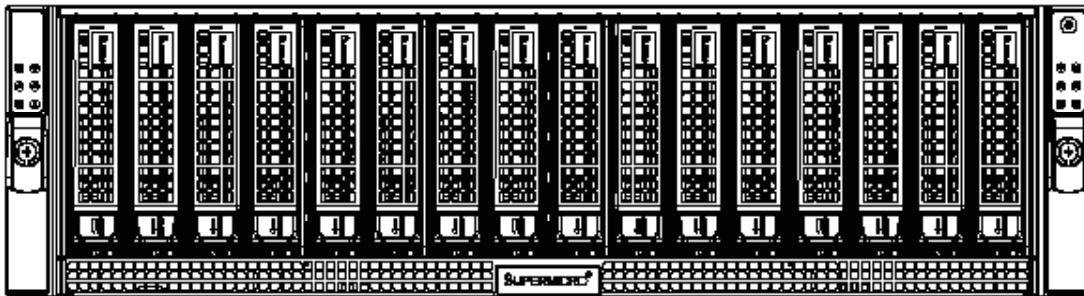


SUPERO[®]

SUPERSERVER 6036ST-6LR



USER'S MANUAL

1.0a

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Release Date: February 9, 2011

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Preface

About This Manual

This manual is written for professional system integrators and PC technicians. It provides information for the installation and use of the SuperServer 6036ST-6LR. Installation and maintenance should be performed by experienced technicians only.

The SuperServer 6036ST-6LR is a high-end storage server solution based on the SC937 3U rackmount chassis and the X8DTS-F dual processor serverboard.

Manual Organization

Chapter 1: Introduction

The first chapter provides a checklist of the main components included with the server system and describes the main features of the X8DTS-F serverboard and the SC937ETS-R1200NDBP chassis.

Chapter 2: Server Installation

This chapter describes the steps necessary to install the SuperServer 6036ST-6LR into a rack and check out the server configuration prior to powering up the system. If your server was ordered without processor and memory components, this chapter will refer you to the appropriate sections of the manual for their installation.

Chapter 3: System Interface

Refer here for details on the system interface, which includes the functions and information provided by the control panels on the chassis as well the HDD carrier LEDs.

Chapter 4: System Safety

You should thoroughly familiarize yourself with this chapter for a general overview of safety precautions that should be followed when installing and servicing the SuperServer 6036ST-6LR.

Chapter 5: Advanced Serverboard Setup

Chapter 5 provides detailed information on the X8DTS-F serverboard, including the locations and functions of connections, headers and jumpers. Refer to this chapter when adding or removing processors or main memory and when reconfiguring the serverboard.

Chapter 6: Advanced Chassis Setup

Refer to Chapter 6 for detailed information on the SC937 server chassis. You should follow the procedures given in this chapter when installing, removing or reconfiguring SAS/SATA or peripheral drives and when replacing system power supply units and cooling fans.

Chapter 7: BIOS

The BIOS chapter includes an introduction to BIOS and provides detailed information on running the CMOS Setup Utility.

Appendix A: BIOS Error Beep Codes

Appendix B: System Specifications

Notes

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Appendix A BIOS Error Beep Codes

Appendix B System Specifications

Chapter 1

Introduction

1-1 Overview

The SuperServer 6036ST-6LR is a high-end Super Storage Bridge Bay (SBB) system comprised of two main subsystems: the SC937 chassis and two X8DTS-F dual processor serverboards. Please refer to our web site for information on operating systems that have been certified for use with the system (www.supermicro.com).

In addition to the serverboard and chassis, various hardware components have been included with the 6036ST-6LR, as listed below:

- Four passive CPU heatsinks (SNK-P0037P)
- Twelve 4-cm fans (FAN-0088L4)
- Two KVM cables (CBL-0218L)
- SAS/SATA Accessories
 - One SAS midplane (BPN-SAS-937-O-P)
 - Sixteen hard drive carriers (MCP-220-97301-0B)
 - SATA interposer add-on cards (optional, AOC-LSISS9252)
- Two riser cards for PCI-Express x16 expansion cards (RSC-R2UT-2E4E8R)
- Two SAS controller mezzanine cards (AOM-SAS2-L8)
- One set of rackmount hardware (MCP-290-00053-ON)
- One CD containing drivers and utilities
- SuperServer 6036ST-6LR User's Manual

1-2 Serverboard Features

The SuperServer 6036ST-6LR is built around two X8DTS-F serverboards for a dual-node system. The X8DTS-F is a dual processor serverboard based on the Intel® 5520 chipset (5520/IOH-36D + ICH10). Below are the main features of the X8DTS-F. (See Figure 1-1 for a block diagram of the chipset).

Processors

The X8DTS-F supports single or dual Intel® Xeon 5500/5600 Series processors in LGA1366 type sockets. Two X8DTS-F boards are included in the storage system. Please refer to the serverboard description pages on our web site for a complete listing of supported processors (www.supermicro.com).

Memory

Each X8DTS-F has six DIMM slots that can support up to 48 GB of ECC registered DDR3-1333/1066/800 or up to 24 GB of ECC/non-ECC unbuffered DDR3-1333/1066/800 SDRAM. See Chapter 5 for details.

SAS

SAS 2.0 support with a x36 expander is provided with an LSI 2008 SAS controller option on a mezzanine card (p/n AOM-SAS2-L8). A total of 16 SAS hot-swap drives are supported.

Notes: The operating system you use must have RAID support to enable the hot-swap capability and RAID function of the SAS drives. LSI 2008 supports RAID 0, 1, 10 and 1E modes. Refer to the following ftp site for setup guidelines: <ftp://ftp.supermicro.com/driver/SAS/LSI/LSI_SAS_EmbMRAID_SWUG.pdf> and Supermicro's web site for additional information < <http://www.supermicro.com/support/manuals/>> (RAID is supported by third-party software.)

SATA

Special add-on cards installed in the drive carriers provide support for SATA drives. Each carrier must have one AOC-LSISS9252 card installed to support a SATA drive. See Chapter 6 for details.

PCI Expansion Slots

Each X8DTS-F can support two PCI-E x4 and one PCI-E x8 add-on cards with the use of a RSC-R2UT-2E4E8R riser card (included).

Rear Chassis Ports

The rear of the chassis includes one SAS port, two 1 GB Ethernet ports and a KVM connector (includes USB, VGA and COM ports) for each node (serverboard).

Graphics Controller

The X8DTS-F features an integrated Matrox G200eW video controller. The G200eW is a 2D/3D/video accelerator chip with a 128-bit core.

Other Features

Other onboard features that promote system health include onboard voltage monitors, auto-switching voltage regulators, chassis and CPU overheat sensors, virus protection and BIOS rescue.

1-3 Server Chassis Features

System Power

The SC937 features a redundant Gold Level 1200W power supply composed of two separate power modules. This power redundancy feature allows you to replace a failed power module without shutting down the system.

SAS/SATA Subsystem

The SC937 supports up to 16 SAS 2.0 or SATA drives. These drives are hot-swappable units and are connected to a midplane that provides power and control.

Note: The operating system you use must have RAID support to enable the hot-swap capability of the SAS/SATA drives.

Front Control Panel

Two control panels are included on each end of the SuperServer 6036ST-6LR to provide you with system monitoring and control. LEDs indicate system power, network (NIC) activity, system overheat and power supply failure. Each set of LEDs are associated with the node/serverboard on the same side of the chassis. A single power button is located on the right side control panel. When pressed, both nodes will power on or off.

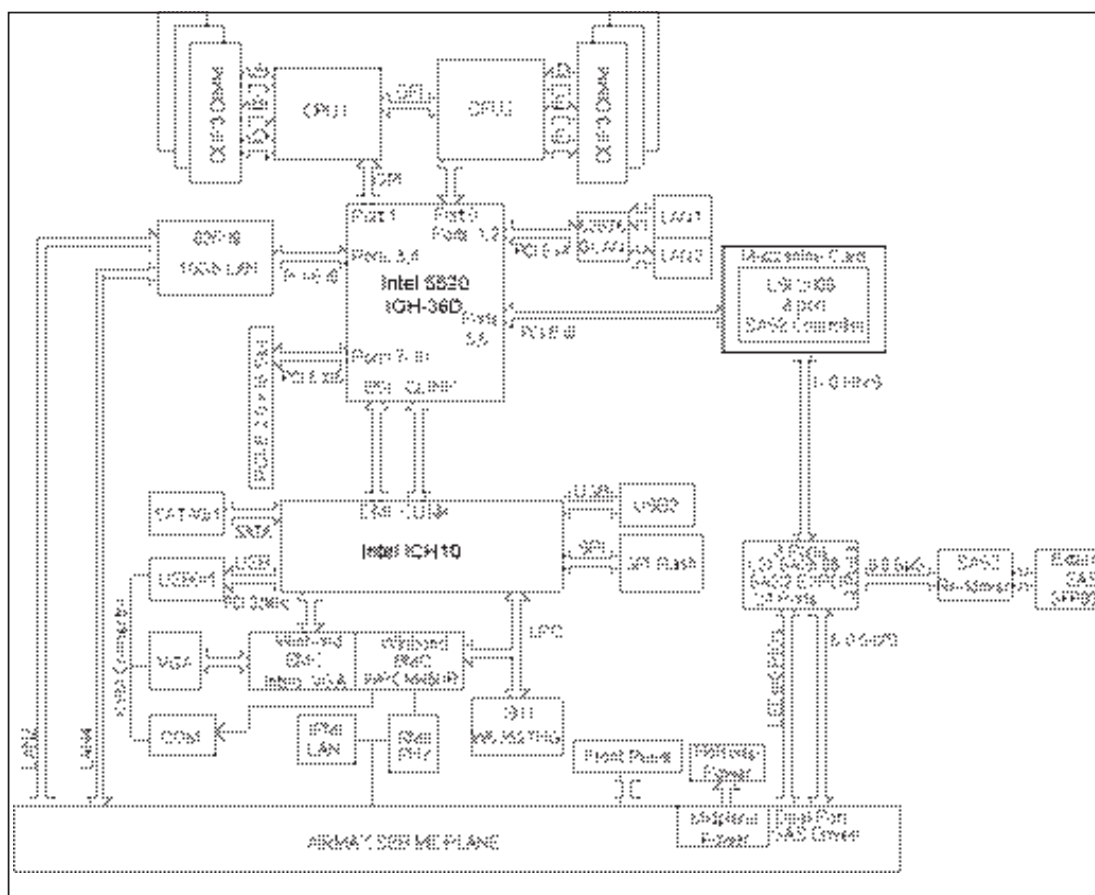
Cooling System

The SC937 chassis has six fans: three at the front and another three at the rear (consisting of two sets of three 4-cm counter-rotating fans). This counter-rotating action works to dampen vibration levels while generating exceptional airflow. Two additional pairs of counter-rotating fans are included at the rear of each of the two nodes/serverboards.

Another set of back-to-back fans are also located on each serverboard in front of the CPU2 socket. Each power supply module also includes a cooling fan.

**Figure 1-1. Intel I5520 + OH-36D/ICH10 Chipset:
System Block Diagram**

Note: This is a general block diagram. Please see Chapter 5 for details.



1-4 Contacting Supermicro

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Web Site: www.supermicro.com.tw

Technical Support:

Email: support@supermicro.com.tw

Tel: 886-2-8228-1366, ext.132 or 139

1-5 SBB: Storage Bridge Bay

The 6036ST-6LR Super SBB was designed to function as a fully redundant, fault-tolerant "cluster-in-a-box" system. The standard support for 16 3.5" hot-swap HDDs (SAS1, SAS2 or Enterprise SATA) may be expanded to support an additional 16 HDDs with the optional SBB JBOD SYS-937R-E2JB configuration.

The Super SBB provides hot-swappable canisters for all active components. Each of the two serverboard canisters support dual-processors, 6 DIMM slots, 3 PCI-E Gen2 slots and 6 Gbps SAS (SAS2). With dual 10GbE connections between the serverboards via the midplane, if one serverboard fails, the other serverboard is able to take over control and access the HDDs to keep the system up and running (both controllers can also work in active mode). Storage software used to enable this feature is available from several Supermicro partners.

Equipped with 1200W (Gold Level) high-efficiency redundant power supplies and redundant cooling fans, the 6026ST-6LR is a high-available, high-reliability storage system at a competitive price.

Chapter 2

Server Installation

2-1 Overview

This chapter provides a quick setup checklist to get your SuperServer 6036ST-6LR up and running. Following these steps in the order given should enable you to have the system operational within a minimum amount of time. This quick setup assumes that your system has come to you with the processors and memory preinstalled. If your system is not already fully integrated with a serverboard, processors, system memory etc., please turn to the chapter or section noted in each step for details on installing specific components.

2-2 Unpacking the System

You should inspect the box the SuperServer 6036ST-6LR was shipped in and note if it was damaged in any way. If the server itself shows damage you should file a damage claim with the carrier who delivered it.

Decide on a suitable location for the rack unit that will hold the SuperServer 6036ST-6LR. It should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise and electromagnetic fields are generated. You will also need it placed near a grounded power outlet. Read the Rack and Server Precautions in the next section.

2-3 Preparing for Setup

The box the SuperServer 6036ST-6LR was shipped in should include two sets of rail assemblies, two rail mounting brackets and the mounting screws you will need to install the system into the rack. Follow the steps in the order given to complete the installation process in a minimum amount of time. Please read this section in its entirety before you begin the installation procedure outlined in the sections that follow.

Choosing a Setup Location

- Leave enough clearance in front of the rack to enable you to open the front door completely (~25 inches) and approximately 30 inches of clearance in the back of the rack to allow for sufficient airflow and ease in servicing.

- This product is for installation only in a Restricted Access Location (dedicated equipment rooms, service closets and the like).
- This product is not suitable for use with visual display work place devices according to §2 of the the German Ordinance for Work with Visual Display Units.



Warnings and Precautions!



Rack Precautions

- Ensure that the leveling jacks on the bottom of the rack are fully extended to the floor with the full weight of the rack resting on them.
- In single rack installation, stabilizers should be attached to the rack. In multiple rack installations, the racks should be coupled together.
- Always make sure the rack is stable before extending a component from the rack.
- You should extend only one component at a time - extending two or more simultaneously may cause the rack to become unstable.

Server Precautions

- Review the electrical and general safety precautions in Chapter 4.
- Determine the placement of each component in the rack *before* you install the rails.
- Install the heaviest server components on the bottom of the rack first, and then work up.
- Use a regulating uninterruptible power supply (UPS) to protect the server from power surges, voltage spikes and to keep your system operating in case of a power failure.
- Allow any hot plug drives and power supply modules to cool before touching them.
- Always keep the rack's front door and all panels and components on the servers closed when not servicing to maintain proper cooling.

Rack Mounting Considerations

Ambient Operating Temperature

If installed in a closed or multi-unit rack assembly, the ambient operating temperature of the rack environment may be greater than the ambient temperature of the room. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature (T_{mra}).

Reduced Airflow

Equipment should be mounted into a rack so that the amount of airflow required for safe operation is not compromised.

Mechanical Loading

Equipment should be mounted into a rack so that a hazardous condition does not arise due to uneven mechanical loading.

Circuit Overloading

Consideration should be given to the connection of the equipment to the power supply circuitry and the effect that any possible overloading of circuits might have on overcurrent protection and power supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

Reliable Ground

A reliable ground must be maintained at all times. To ensure this, the rack itself should be grounded. Particular attention should be given to power supply connections other than the direct connections to the branch circuit (i.e. the use of power strips, etc.).

2-4 Installing the System into a Rack

This section provides information on installing the SC937 chassis into a rack unit with the quick-release rails provided. There are a variety of rack units on the market, which may mean the assembly procedure will differ slightly. You should also refer to the installation instructions that came with the rack unit you are using.

Installing the Inner Rack Rails

Installing the Inner Rails

1. Extend the inner rail toward the front of the rail assembly as far as possible, then depress the locking tab to pull it completely out.
2. Place the inner rail on the side of the chassis aligning the hooks of the chassis with the rail extension holes.
3. Slide the extension toward the front of the chassis.
4. You may secure the chassis with screws if desired.
5. Repeat steps 1-3 for the other inner rail.

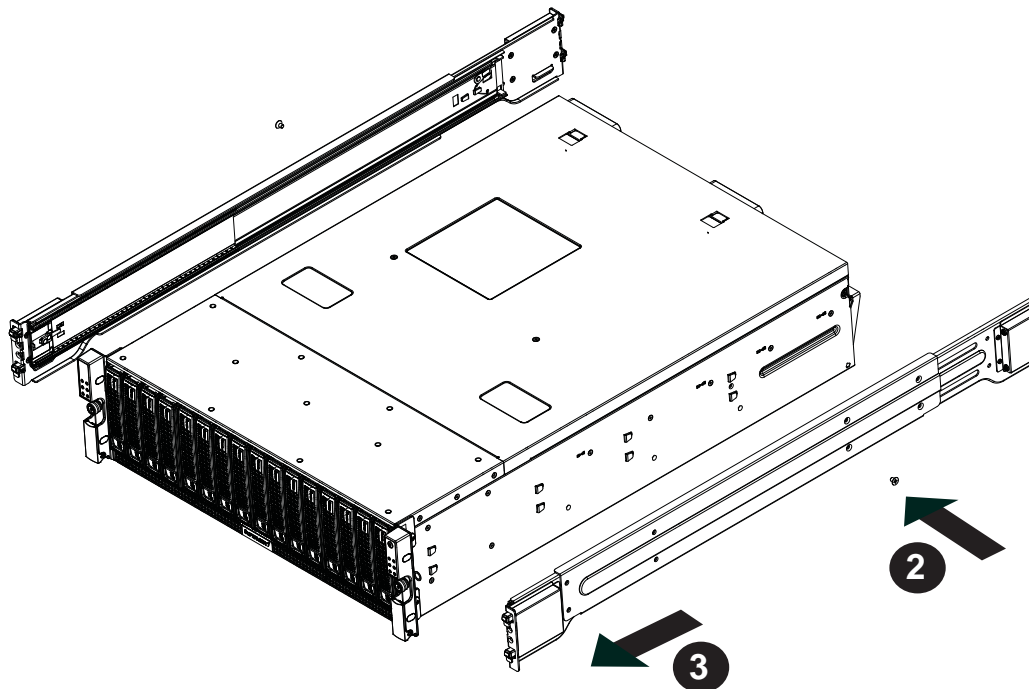


Figure 2-1. Installing the Inner Rack Rails

Installing the Outer Rack Rails

Outer rails attach to the server rack and hold the server in place. The outer rails for the SC937 chassis extend between 30 inches and 33 inches.

Installing the Outer Rails

1. Attach the right outer rail to the rack by inserting the hooks included on the rails into the holes provided on the rack.
2. If desired, screw the rails to the chassis for added support.
3. Repeat these steps for the left outer rail.

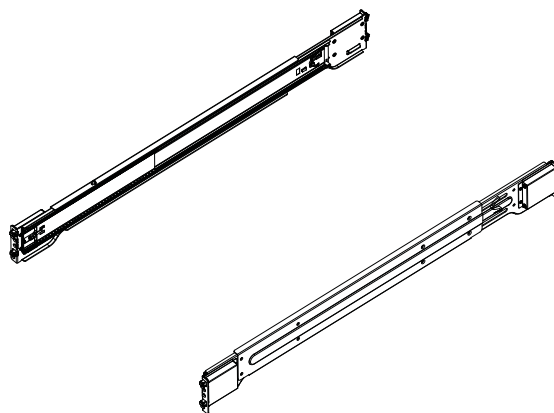


Figure 2-2. Outer Rack Rails

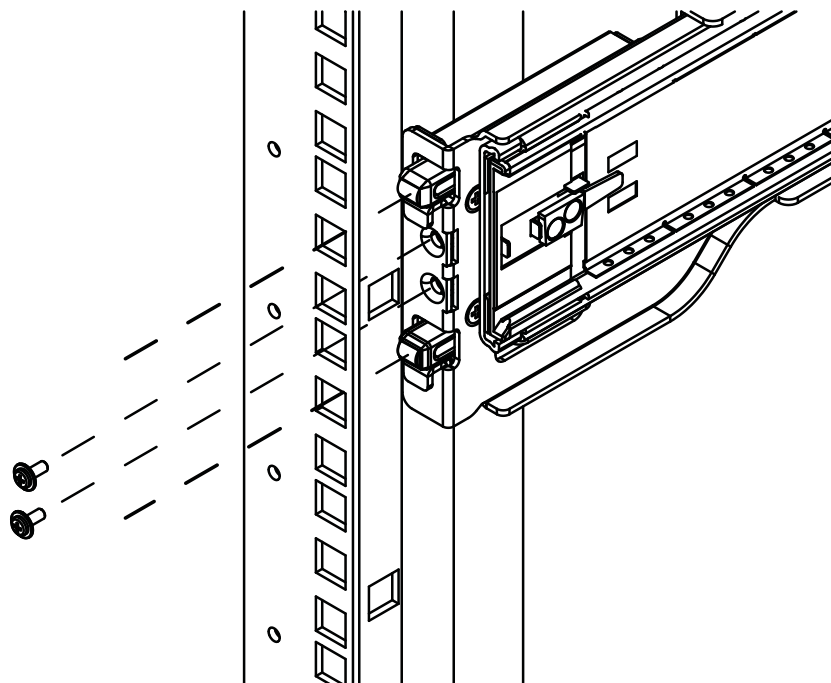


Figure 2-3. Outer Rack Rail Install

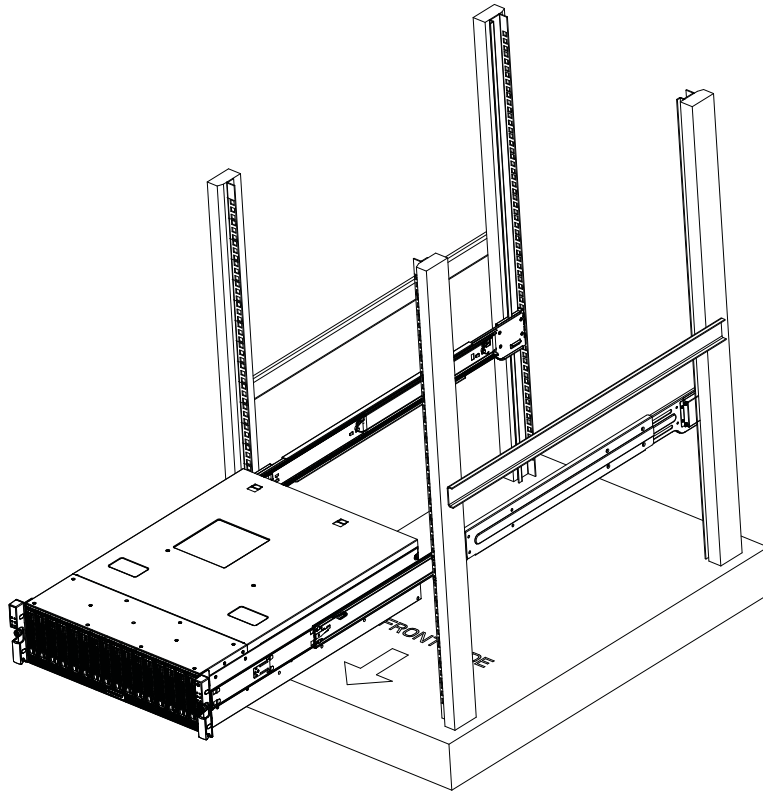


Figure 2-3. Installing the Chassis into the Rack

Installing the Chassis into a Rack

Installing into a Rack

1. Confirm that the inner and outer rails are properly installed.
2. Line up the inner (chassis) rails with the front of the outer (rack) rails.
3. Slide the chassis rails into the rack rails, keeping the pressure even on both sides (you may have to depress the locking tabs when inserting). When the server has been pushed completely into the rack, you should hear the locking tabs "click" into position.
4. (Optional) Insert and tighten the thumbscrews that hold the front of the server to the rack.

2-5 Checking the Serverboard Setup

After you install the 6036ST-6LR in the rack, you will need to open the unit to make sure the serverboard is properly installed and all the connections have been made.

Accessing the Inside of the System (Figure 2-4)

1. Remove the two screws that secure the top cover of the chassis.
2. Slide the cover toward the rear of the chassis and lift the cover off the unit.

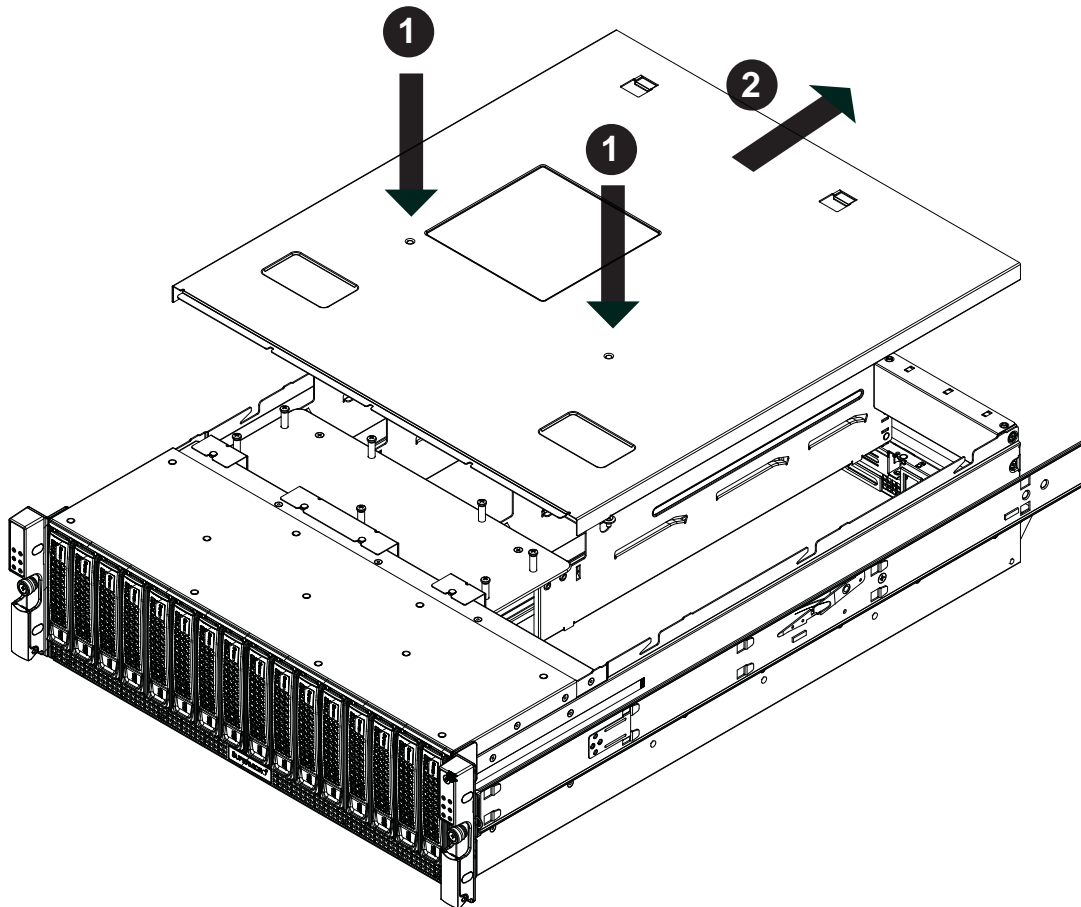
Checking the Components and Setup

1. You may have one or two processors already installed into the serverboard. Each processor needs its own heat sink. See Chapter 5 for instructions on processor and heat sink installation.
2. Your 6036ST-6LR server system may have come with system memory already installed. Make sure all DIMMs are fully seated in their slots. For details on adding system memory, refer to Chapter 5.
3. If desired, you can install PCI expansion cards to the system. See Chapter 5 for details on installing PCI expansion cards.
4. Make sure all power and data cables are properly connected and not blocking the chassis airflow. Also make sure that no cables are positioned in front of the fans. See Chapter 5 for details on cable connections.



Warning: Except for short periods of time, do NOT operate the server without the cover in place. The chassis cover must be in place to allow proper airflow and prevent overheating.

Figure 2-4. Accessing the Inside of the System



2-6 Checking the Drive Bay Setup

Next, you should check to make sure the peripheral drives and the SAS/SATA drives have been properly installed and all connections have been made.

Checking the Drives

1. The hard drives can be installed and removed from the front of the chassis without removing the top chassis cover.
2. Depending upon your system's configuration, your system may have one or more drives already installed. If you need to install hard drives, please refer to Chapter 6.

Checking the Airflow

1. Airflow is provided by 4-cm counter-rotating fans. The system component layout was carefully designed to direct sufficient cooling airflow to the components that generate the most heat. See Chapter 6 for details.
2. Note that all power and data cables have been routed in such a way that they do not block the airflow generated by the fans.

Providing Power

1. Plug the power cord(s) from the power supply unit(s) into a high-quality power strip that offers protection from electrical noise and power surges. It is recommended that you use an uninterruptible power supply (UPS).
2. Depress the power on button on the front of the chassis.

Notes

Chapter 3

System Interface

3-1 Overview

There are several LEDs on two control panels as well as others on the drive carriers to keep you constantly informed of the overall status of the system as well as the activity and health of specific components. A main power button is also located on the right side (only) control panel.

3-2 Control Panel Button



Power

The single button located on the right control panel is the power on/off button. Depressing this button will either power both nodes on or off. Turning off system power with this button removes the main power but keeps standby power supplied to the system.

3-3 Control Panel LEDs

The two control panels located on the front of the chassis have several LEDs. With the exception of the power fail LED, these LEDs provide you with critical information related to the node on the same side of the chassis. This section explains what each LED indicates when illuminated and any corrective action you may need to take.



Power Fail

Indicates a power supply module has failed. The second power supply module will take the load and keep the system running but the failed module will need to be replaced. Refer to Chapter 6 for details on replacing the power supply. This LED should be off when the system is operating normally.

**Overheat/Fan Fail:**

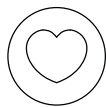
When this LED flashes, it indicates a fan failure. When on continuously it indicates an overheat condition, which may be caused by cables obstructing the airflow in the system or the ambient room temperature being too warm. Check the routing of the cables and make sure all fans are present and operating normally. You should also check to make sure that the chassis covers are installed. Finally, verify that the heatsinks are installed properly (see Chapter 5). This LED will remain flashing or on as long as the indicated condition exists.

**NIC1**

Indicates network activity on the LAN1 port when flashing.

**NIC2**

Indicates network activity on the LAN2 port when flashing.

**Heartbeat**

On the SuperServer 6036ST-6LR, this is a serverboard heartbeat LED and indicates that power is being supplied to the serverboard.



Power

Indicates power is being supplied to the system's power supply units. This LED should normally be illuminated when the system is operating.

3-4 Drive Carrier LEDs

Each drive carrier has two LEDs:

- **Green:** When illuminated, the green LED on the drive carrier indicates the drive is powered on. If this LED is not lit, it means no power is being provided for the drive. Please refer to Chapter 6 for instructions on replacing failed drives.
- **Red:** A steady red LED indicates a drive failure. If one of the drives fails, you should be notified by your system management software. Please refer to Chapter 6 for instructions on replacing failed drives. If this LED flashes ~ once per second (1 Hz) it indicates RAID rebuilding activity.

Notes

Chapter 4

System Safety

4-1 Electrical Safety Precautions



Basic electrical safety precautions should be followed to protect yourself from harm and the SuperServer 6036ST-6LR from damage:

- Be aware of the locations of the power on/off switch on the chassis as well as the room's emergency power-off switch, disconnection switch or electrical outlet. If an electrical accident occurs, you can then quickly remove power from the system.
- Do not work alone when working with high voltage components.
- Power should always be disconnected from the system when removing or installing main system components, such as the serverboard, memory modules and floppy drive. When disconnecting power, you should first power down the system with the operating system. The unit has more than one power supply cord. Disconnect both power supply cords before servicing to avoid electrical shock.
- When working around exposed electrical circuits, another person who is familiar with the power-off controls should be nearby to switch off the power if necessary.
- Use only one hand when working with powered-on electrical equipment. This is to avoid making a complete circuit, which will cause electrical shock. Use extreme caution when using metal tools, which can easily damage any electrical components or circuit boards they come into contact with.
- Do not use mats designed to decrease static electrical discharge as protection from electrical shock. Instead, use rubber mats that have been specifically designed as electrical insulators.
- The power supply power cords must include a grounding plug and must be plugged into grounded electrical outlets.

- This product may be connected to an IT power system. In all cases, make sure that the unit is also reliably connected to Earth (ground).
- Serverboard Battery: **CAUTION** - There is a danger of explosion if the onboard battery is installed upside down, which will reverse its polarities (see Figure 4-1). This battery must be replaced only with the same or an equivalent type recommended by the manufacturer (CR2032). Dispose of used batteries according to the manufacturer's instructions.
- DVD-ROM Laser: **CAUTION** - this server may have come equipped with a DVD-ROM drive. To prevent direct exposure to the laser beam and hazardous radiation exposure, do not open the enclosure or use the unit in any unconventional way.
- Mainboard replaceable soldered-in fuses: Self-resetting PTC (Positive Temperature Coefficient) fuses on the mainboard must be replaced by trained service technicians only. The new fuse must be the same or equivalent as the one replaced. Contact technical support for details and support.

4-2 General Safety Precautions



Follow these rules to ensure general safety:

- Keep the area around the 6036ST-6LR clean and free of clutter.
- The 6036ST-6LR weighs approximately 75 lbs (34 kg.) when fully loaded. When lifting the system, two people at either end should lift slowly with their feet spread out to distribute the weight. Always keep your back straight and lift with your legs.
- Place the chassis top cover and any system components that have been removed away from the system or on a table so that they won't accidentally be stepped on.
- While working on the system, do not wear loose clothing such as neckties and unbuttoned shirt sleeves, which can come into contact with electrical circuits or be pulled into a cooling fan.

- Remove any jewelry or metal objects from your body, which are excellent metal conductors that can create short circuits and harm you if they come into contact with printed circuit boards or areas where power is present.
- After accessing the inside of the system, close the system back up and secure it to the rack unit with the retention screws after ensuring that all connections have been made.

4-3 ESD Precautions



Electrostatic Discharge (ESD) is generated by two objects with different electrical charges coming into contact with each other. An electrical discharge is created to neutralize this difference, which can damage electronic components and printed circuit boards. The following measures are generally sufficient to neutralize this difference before contact is made to protect your equipment from ESD:

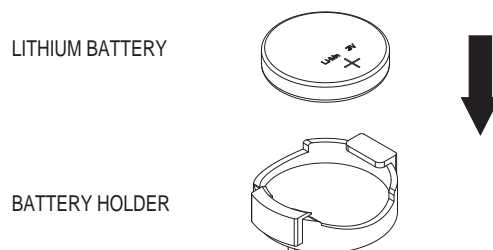
- Use a grounded wrist strap designed to prevent static discharge.
- Keep all components and printed circuit boards (PCBs) in their antistatic bags until ready for use.
- Touch a grounded metal object before removing the board from the antistatic bag.
- Do not let components or PCBs come into contact with your clothing, which may retain a charge even if you are wearing a wrist strap.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or contacts.
- When handling chips or modules, avoid touching their pins.
- Put the serverboard and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the serverboard.

4-4 Operating Precautions



Care must be taken to assure that the chassis cover is in place when the 6036ST-6LR is operating to assure proper cooling. Out of warranty damage to the system can occur if this practice is not strictly followed.

Figure 4-1. Installing the Onboard Battery



Please handle used batteries carefully. Do not damage the battery in any way; a damaged battery may release hazardous materials into the environment. Do not discard a used battery in the garbage or a public landfill. Please comply with the regulations set up by your local hazardous waste management agency to dispose of your used battery properly.

Chapter 5

Advanced Serverboard Setup

This chapter provides detailed information on the X8DTS-F serverboard. All serverboard jumpers and connections are described. A layout and quick reference chart are also included in this chapter for your reference. Remember to completely close the chassis when you have finished working with the serverboard to better cool and protect the system.

5-1 Handling the Serverboard

Electrostatic Discharge (ESD) can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully (see previous chapter). To prevent the serverboard from bending, keep one hand under the center of the board to support it when handling. The following measures are generally sufficient to protect your equipment from electric static discharge.

Precautions

- Use a grounded wrist strap designed to prevent Electrostatic Discharge (ESD).
- Touch a grounded metal object before removing any board from its antistatic bag.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the serverboard, add-on cards and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the serverboard.

Unpacking

The serverboard is shipped in antistatic packaging to avoid electrical static discharge. When unpacking the board, make sure the person handling it is static protected.

5-2 Cable and Device Connections

All data and power connections between the serverboard to the system (including the power supplies and the hard drives) are provided through the midplane. Most of these connections are made automatically when the system is assembled. "Right" and "left" refer to the side of the chassis as viewed from the front of the system. Also refer to Chapter 6 Section 5 for an image of the midplane with the connections listed below.

Power Connections

Power is routed from the power supplies to the power distribution board which in turn connects to the midplane. When the serverboards are seated in their bays they plug into the midplane to receive power.

Fan Cabling

On each side of the midplane are three 4-pin fan headers. These are cabled to the fans that reside in the fan assemblies located above each node/serverboard. The fans on the serverboards themselves (one each) connect to the "Fan1" header on the serverboard.

Control Panels

A ribbon cable connects each control panel to the midplane. The right and left side control panels connect to JP1 and JP2 on the midplane, respectively.

SSB Connections

Along one end of each serverboard are several square SSB (Simulation Service Bus) headers. These headers provide logic, data and power to the serverboards. The connections to these headers are made automatically when the serverboard is fully seated in its bay within the chassis.

5-3 Installing the Processor and Heatsink



When handling the processor package, avoid placing direct pressure on the label area of the fan.

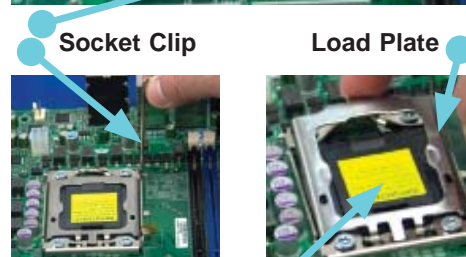
Notes:

- Always connect the power cord last and always remove it before adding, removing or changing any hardware components. Make sure that you install the processor into the CPU socket before you install the CPU heatsink.
- If you buy a CPU separately, make sure that you use an Intel-certified multi-directional heatsink only.
- Make sure to install the serverboard into the chassis before you install the CPU heatsinks.
- When receiving a serverboard without a processor pre-installed, make sure that the plastic CPU socket cap is in place and none of the socket pins are bent; otherwise, contact your retailer immediately.
- Refer to the Supermicro web site for updates on CPU support.

Installing an LGA1366 Processor

1. Press the socket clip to release the load plate, which covers the CPU socket, from its locked position.
2. Gently lift the socket clip to open the load plate.
3. Hold the plastic cap at its north and south center edges to remove it from the CPU socket.

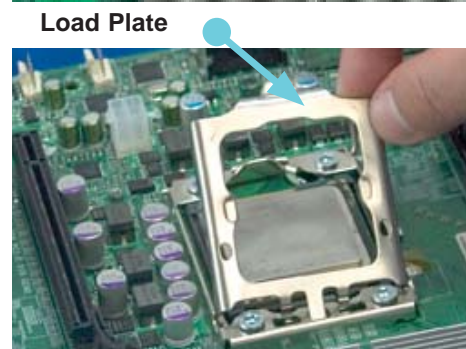
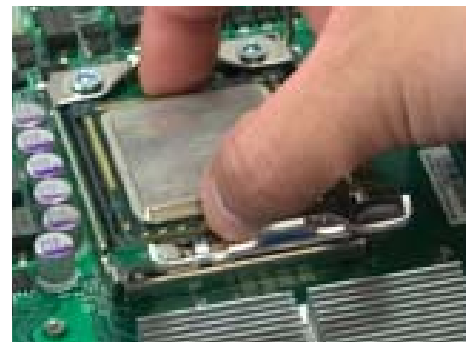
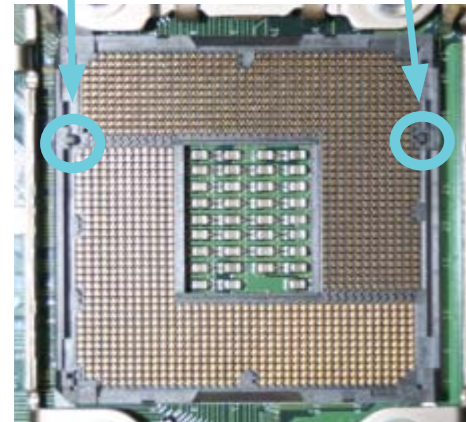
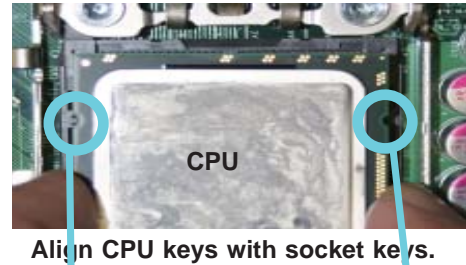
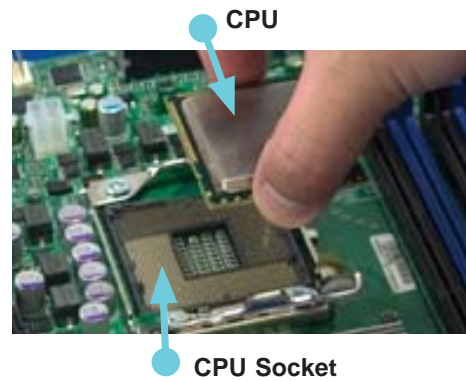
Note: The photos on this page and succeeding pages are for illustration purposes only. They do not necessarily reflect the exact product(s) described in this manual.



Holding the north & south edges

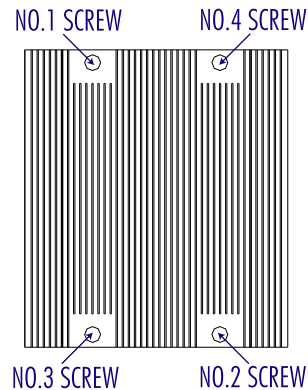
1. After removing the plastic cap, use your thumb and the index finger to hold the CPU at the north and south center edges.
2. Align the CPU key (the semi-circle cutout) with the socket key (the notch below the gold color dot on the side of the socket).
3. Once the CPU and the socket are aligned, carefully lower the CPU straight down into the socket. Do not rub the CPU against the surface of the socket or its pins to avoid damaging the CPU or the socket.
4. With the CPU in the socket, inspect the four corners of the CPU to make sure that it sits level and is properly installed.
5. Once the CPU is securely seated in the socket, lower the CPU load plate to the socket.
6. Use your thumb to gently push the socket clip down to the clip lock.

Important! Please save the plastic cap. The serverboard must be shipped with the plastic cap properly installed to protect the CPU socket pins. Shipment without the plastic cap properly installed may cause damage to the socket pins.



Installing the Heatsink

1. Place the heatsink on top of the CPU so that the four mounting holes are aligned with those on the retention mechanism.
2. Screw in two diagonal screws (i.e. the #1 and the #2 screws) until just snug (do not over-tighten the screws, which may damage the CPU.)
3. Finish the installation by fully tightening all four screws.



Removing the Heatsink



Warning: We do not recommend removing the CPU or the heatsink. If you do need to remove the heatsink, please follow the instructions below to prevent damage to the CPU or other components.

1. Power down the node and unplug the AC power cord.
2. Unscrew and remove the heatsink screws in the sequence shown in the illustration above.
3. Hold the heatsink and gently wiggle it to loosen it from the CPU. (Do not use excessive force when doing this!)
4. Once the heatsink is loosened, remove it from the CPU.
5. Clean the surface of the CPU and the heatsink to get rid of the old thermal grease. Reapply the proper amount of thermal grease before you re-install the heatsink.

5-4 Installing Memory



CAUTION! Exercise extreme care when installing or removing DIMM modules to prevent any possible damage.

Memory Support

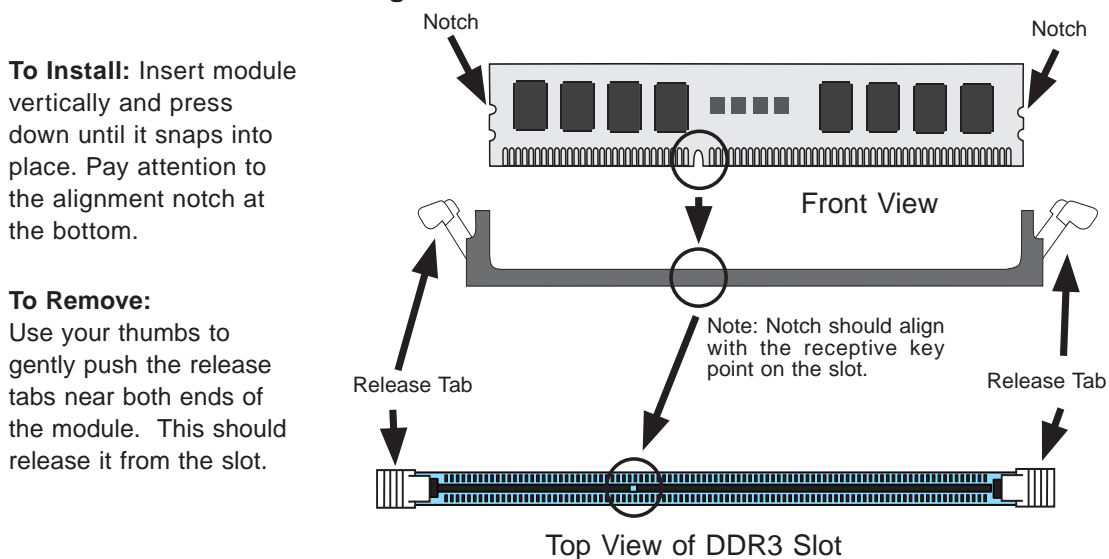
The X8DTS-F supports up to 48 GB of ECC registered DDR3-1333/1066/800 or up to 24 GB of ECC/non-ECC unbuffered DDR3-1333/1066/800 SDRAM in six DIMM slots. Use memory modules of the same type and speed. See the following tables for memory installation.

DIMM Installation

Installing Memory Modules

1. Insert the desired number of DIMMs into the memory slots starting with DIMM #P1-DIMM1A. For optimal memory performance, please install a pair (or pairs) of memory modules of the same type and speed (see the Memory Installation Table below).
2. Insert each DIMM module vertically into its slot. Pay attention to the notch along the bottom of the module to avoid installing incorrectly (see Figure 5-3).
3. Gently press down on the DIMM module until it snaps into place in the slot. Repeat for all modules.

Figure 5-3. DIMM Installation



DIMM Module Population Configuration

Follow the tables below when installing memory.

Memory Population for Optimal Performance With One CPU (CPU1) Installed			
	Branch 0	Branch 1	Branch 2
3 DIMMs	P1 DIMM1A	P1 DIMM2A	P1 DIMM3A

Memory Population for Optimal Performance With One CPU (CPU2) Installed			
	Branch 0	Branch 1	Branch 2
3 DIMMs	P2 DIMM1A	P2 DIMM2A	P2 DIMM3A

Registered DIMM (RDIMM) Population Table				
DIMM Slots per Channel	DIMMs Populated per Channel	DIMM Type (Reg.= Registered)	Speeds (in MHz)	Ranks per DIMM (SR=Single Rank, DR=Dual Rank, QR=Quad Rank)
1	1	Reg. DDR3 ECC	800,1066,1333	SR or DR
1	1	Reg. DDR3 ECC	800,1066	QR

Unbuffered DIMM (UDIMM) Population Table				
DIMM Slots per Channel	DIMMs Populated per Channel	DIMM Type (Unb.= Unbuffered)	Speeds (in MHz)	Ranks per DIMM (SR=Single Rank, DR=Dual Rank, QR=Quad Rank)
1	1	Unb. DDR3 ECC/ Non-ECC	800,1066, 1333	SR or DR

Notes: Memory speed support depends on the type of CPU used.

Due to OS limitations, some operating systems may not show more than 4 GB of memory.

Due to memory allocation to system devices, the amount of memory that remains available for operational use will be reduced when 4 GB of RAM is used. The reduction in memory availability is disproportional. See the chart below.

Possible System Memory Allocation & Availability		
System Device	Size	Physical Memory Remaining (-Available) (4 GB Total System Memory)
Firmware Hub flash memory (System BIOS)	1 MB	3.99 GB
Local APIC	4 KB	3.99 GB
Area Reserved for the chipset	2 MB	3.99 GB
I/O APIC (4 Kbytes)	4 KB	3.99 GB
PCI Enumeration Area 1	256 MB	3.76 GB
PCI Express (256 MB)	256 MB	3.51 GB
PCI Enumeration Area 2 (if needed) -Aligned on 256-MB boundary-	512 MB	3.01 GB
VGA Memory	16 MB	2.85 GB
TSEG	1 MB	2.84 GB
Memory available for the OS & other applications		2.84 GB

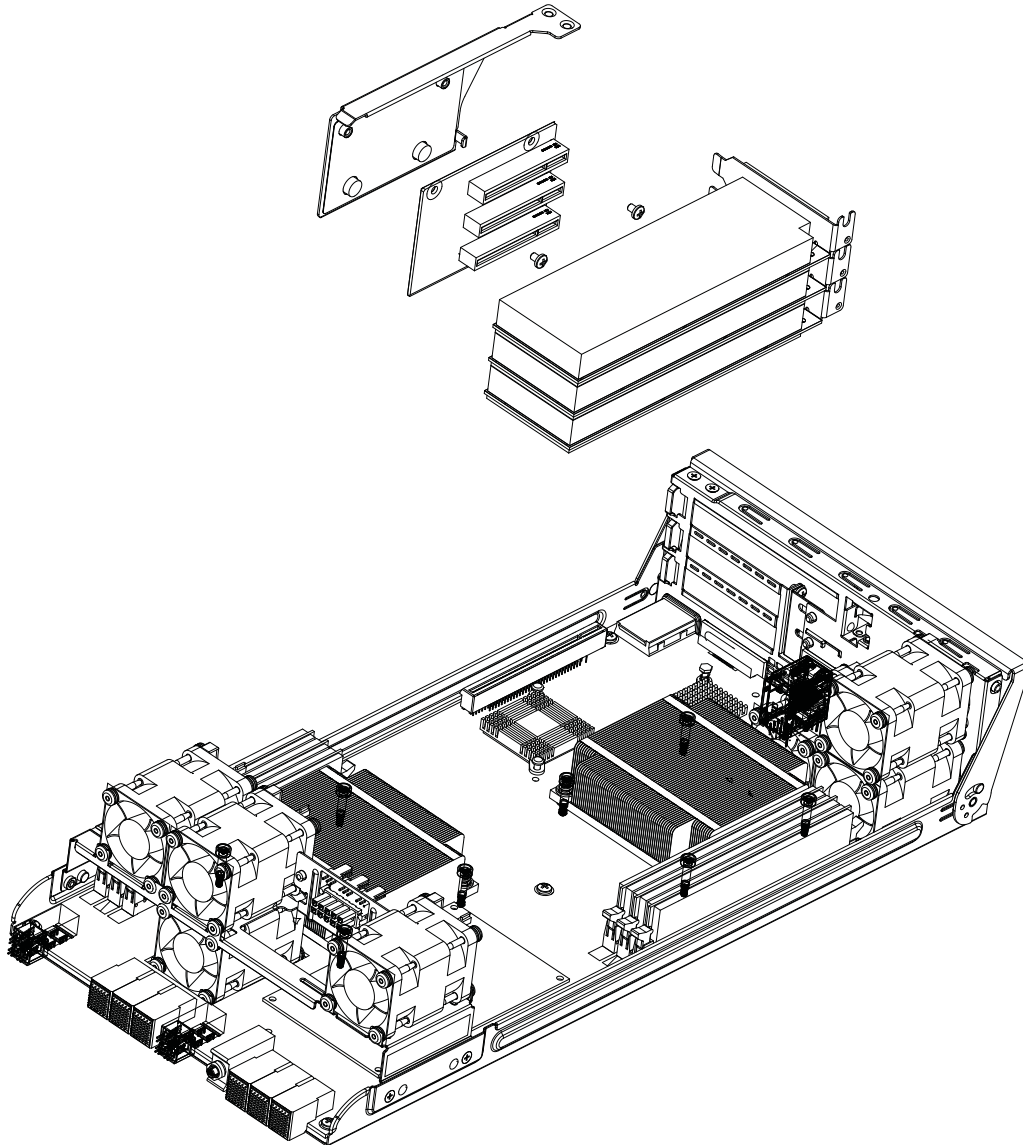
5-5 Installing PCI Add-On Cards

Each node in the 6036ST-6LR can accommodate up to three PCI add-on cards. This may include one PCI-E x8 and two PCI-E x4 cards.

Installing an Add-on Card (Figure 5-4)

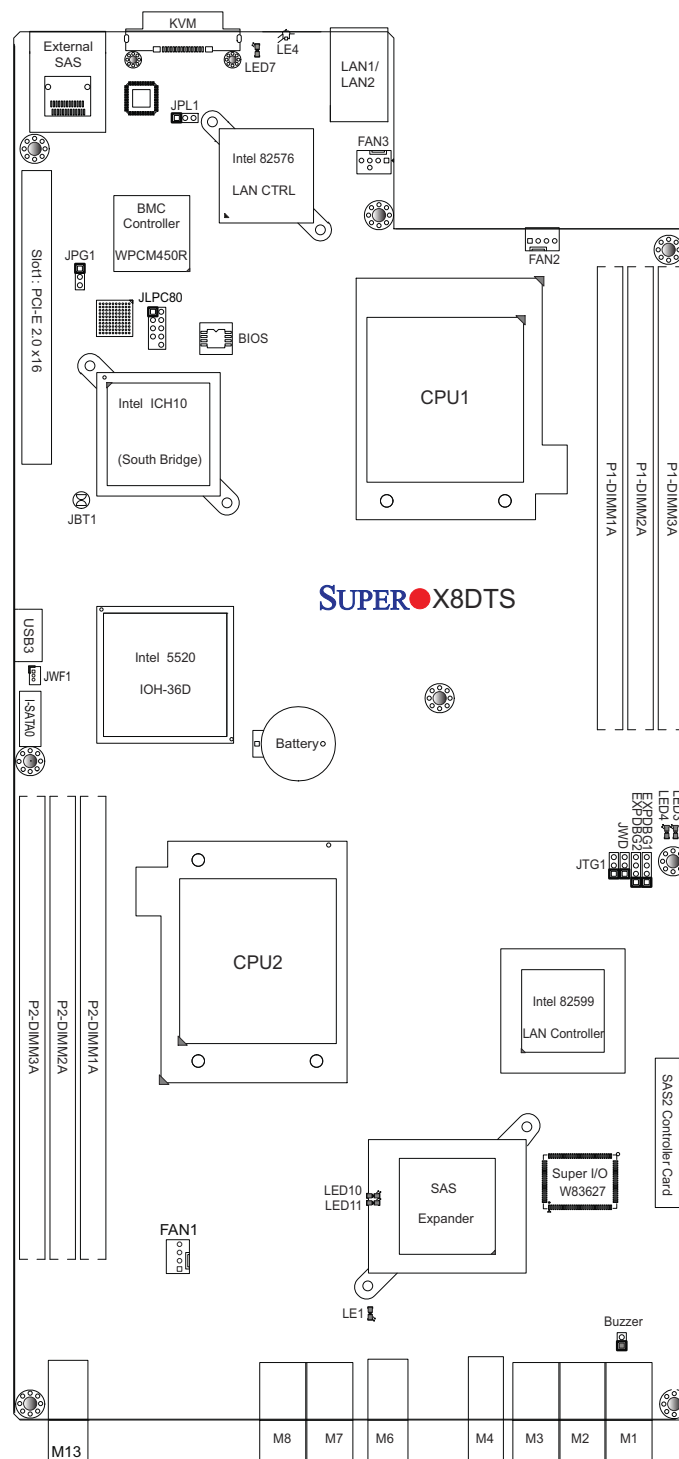
1. Begin by removing the node you wish to populate with add-on cards.
2. Locate the riser card and fully seat the cards into the slots in the riser, pushing down with your thumbs evenly on both sides of the card.
3. If standard size cards are used, only passive heatsinks may be used for the processors as the card size will interfere with active type heatsinks.

Figure 5-4. Installing Add-on Cards



5-6 Serverboard Details

**Figure 5-5. X8DTS-F Layout
(not drawn to scale)**



Note: jumpers not indicated are for test purposes only and should not have their settings changed.

X8DTS-F Quick Reference

Jumper	Description	Default Setting
JBT1	CMOS Clear	(See Section 5-8)
JPG1	VGA Enable/Disable	Pins 1-2 (Enabled)
JPL1	1 Gb LAN1/2 Enable	Pins 1-2 (Enabled)
JTG1	10 Gb LAN1/LAN2 En/Disable	Pins 1-2 (Enabled)
JWD	Watch Dog	Pins 1-2 (Reset)

Connector	Description
FAN 1-3	System/CPU Fan Headers
JWF1	Power Connection for DOM (Disk On Module) Devices
KVM	USB, COM and VGA (for KVM over LAN)
LAN1/2	Gigabit Ethernet (RJ45) Ports
M1~M4, M6~M8, M13	SBB 2.0 Modules
External SAS	External SAS Port
USB3	Universal Serial Bus (USB) Port 3

LED	Description
LE1	Onboard Standby Power Warning LED
LE4	System Heartbeat LED
LED3	10 Gb LAN1 Activity/Link LED
LED4	10 Gb LAN2 Activity/Link LED
LED7	BMC Heartbeat LED

5-7 Connector Definitions

KVM Port (USB/VGA/Serial Port)

The KVM port, located next to the External SAS port on the I/O back-plane, provides USB, VGA and Serial connections. These connections can be used for remote console via BMC IPMI. See the table on the right for pin definitions.

Fan Headers

The X8DTS-F has three fan headers (Fan1 - Fan3). These 4-pin fans headers are backward compatible with traditional 3-pin fans (which do not support fan speed control). Fan speed is controlled by Thermal Management via Hardware Monitoring in the Advanced Setting in the BIOS. (The default setting is Disabled.) See the table on the right for pin definitions.

Fan Header Pin Definitions	
Pin#	Definition
1	Ground
2	+12V
3	Tachometer
4	PWR Modulation

USB (Universal Serial Bus)

A Type A USB port (USB3) is provided on the serverboard. Connect a USB cable here for USB connectivity. (USB cables are not included.) See the table on the right for pin definitions.

Front Panel USB3 Pin Definitions	
Pin#	Definition
1	+5V
2	USB_PN1
3	USB_PP1
4	Ground

Onboard SATA Port

An onboard SATA port is located next to the USB3 port on the serverboard to provide serial-link signal transmission. See the table on the right for pin definitions.

SATA Port Pin Definitions	
Pin#	Definition
1	Ground
2	TX_P
3	TX_N
4	Ground
5	RX_N
6	RX_P
7	Ground

DOM Power Connector

A power connector for DOM (Disk On Module) devices is located at JWF1. Connect the appropriate cable here to provide power support for your DOM device.

DOM Power Pin Definitions	
Pin#	Definition
1	+5V
2	Ground
3	Ground

Ethernet Ports

Two 1Gb Ethernet ports (LAN1 and LAN2) are located near the KVM port on the I/O backplane. These ports accept RJ45 type cables.

Two 10 Gb Ethernet ports are also provided on the serverboard for internal communications and fail-over functions between the two nodes.

Please refer to the following section for LAN LED information.

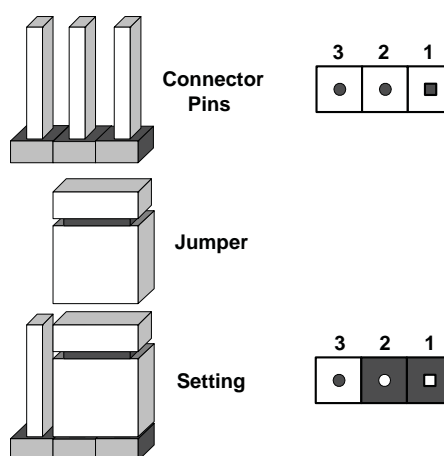


5-8 Jumper Settings

Explanation of Jumpers

To modify the operation of the serverboard, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. See the serverboard layout pages for jumper locations.

Note: On a two-pin jumper, "Closed" means the jumper is on both pins and "Open" means the jumper is either on only one pin or completely removed.



CMOS Clear

JBT1 is used to clear CMOS (which will also clear any passwords). Instead of pins, this jumper consists of contact pads to prevent accidentally clearing the contents of CMOS.

To clear CMOS,

1. First power down the system and unplug the power cord(s).
2. With the power disconnected, short the CMOS pads with a metal object such as a small screwdriver.
3. Remove the screwdriver (or shorting device).
4. Reconnect the power cord(s) and power on the system.

Note: Do not use the PW ON connector to clear CMOS.

VGA Enable/Disable

JPG1 allows you to enable or disable the VGA port. The default position is on pins 1 and 2 to enable VGA. See the table on the right for jumper settings.

VGA Enable/Disable Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

10G-bit LAN Enable/Disable

JTG1 enables or disables the internal 10G-bit Ethernet on the serverboard. See the table on the right for jumper settings.

10G-bit LAN Enable Jumper Settings	
Pin#	Definition
1-2	Enabled (default)
2-3	Disabled

LAN1/2 Enable/Disable

Change the setting of jumper JPL1 to enable or disable the LAN1 and LAN2 Ethernet ports. See the table on the right for jumper settings. The default setting is enabled.

LAN1/2 Enable/Disable Jumper Settings (JPL1)	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

Watch Dog Enable/Disable

Jumper JWD controls the Watch Dog function. Watch Dog is a system monitor that can reboot the system when a software application hangs. Jumping pins 1-2 will cause WD to reset the system if an application hangs. Jumping pins 2-3 will generate a non-maskable interrupt signal for the application that hangs. See the table on the right for jumper settings. Watch Dog must also be enabled in BIOS.

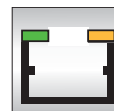
Watch Dog Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Reset
Pins 2-3	NMI
Open	Disabled

Note: When enabled, the user needs to write their own application software in order to disable the Watch Dog Timer.

5-9 Onboard Indicators

LAN LEDs

The Ethernet ports (located on the I/O backplane) have two LEDs. On each port: the green LED flashes to indicate activity while the other LED may be green, amber or off to indicate the speed of the connection. See the table on the right for the functions associated with the connection speed LED.



LAN1/2 LED (Connection Speed Indicator)	
LED Color	Definition
Off	No Connection or 10 Mb/s
Green	100 Mb/s
Amber	1 Gb/s

Onboard Power LED (LE1)

An Onboard Power LED is located at LE1. When on, this LED indicates the system power is on. Be sure to unplug the power cable before removing or adding any components. See the table on the right for more details.

Onboard PWR LED	
LED State	Definition
Off	System Off (PWR cable not connected)
Green	System On
Green: Flashing Quickly	ACPI S1 State

System Heartbeat LED

A System Heartbeat LED is located at LE4. When on, this LED indicates the system is functioning normally. See the table at right for more information.

System Heartbeat LED	
LED State	Definition
On	System Functions Normally
Off	System abnormal

10 Gb LAN1 LED

LED3 is for the (internal) 10 Gb LAN1. When this LED is on, LAN1 is active and functioning normally. See the table at right for more information.

10 Gb LAN1 LED	
LED State	Definition
On	Active & functioning normally.
Off	Off (Inactive)

10 Gb LAN2 LED

LED4 is for the (internal) 10 Gb LAN2. When this LED is on, LAN2 is active and functioning normally. See the table at right for more information.

10 Gb LAN2 LED	
LED State	Definition
On	Active & functioning normally.
Off	Off (Inactive)

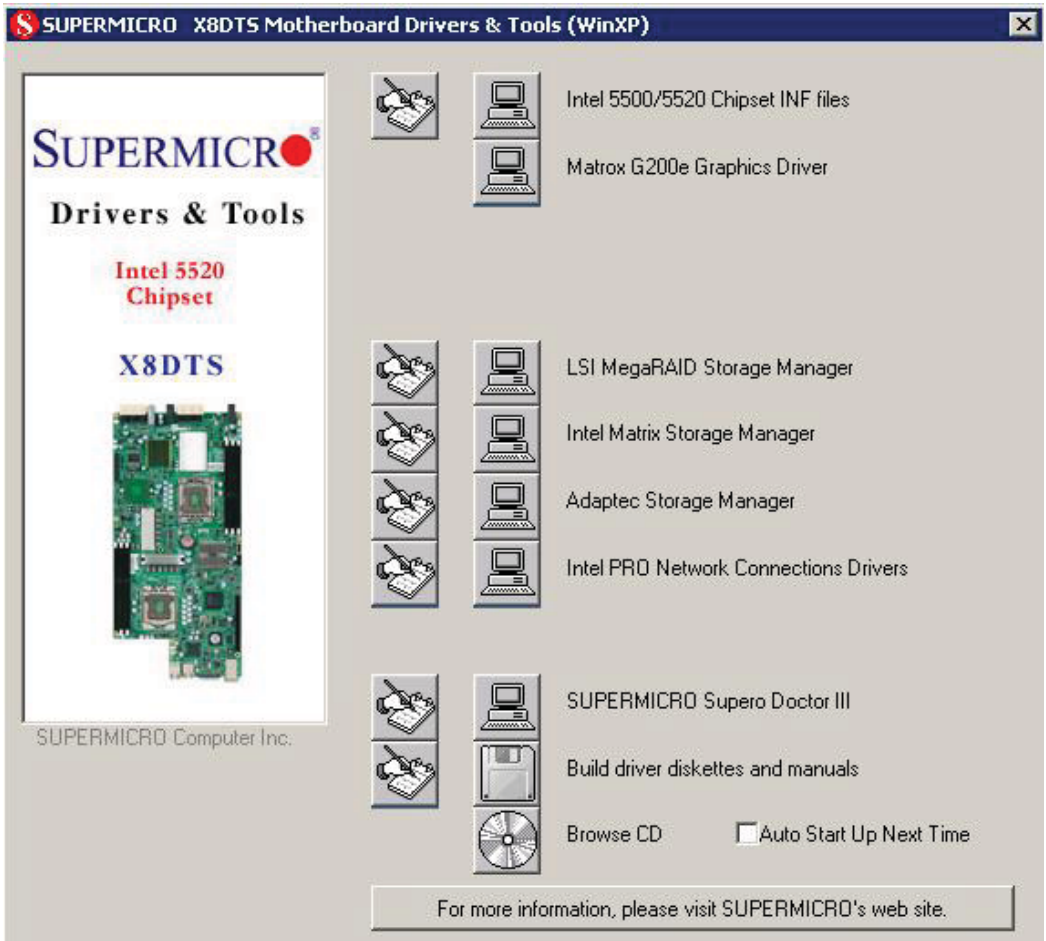
BMC Heartbeat LED

A BMC Heartbeat LED is located at LED7. When this LED is on, the BMC is functioning normally. See the table at right for more information.

BMC Heartbeat LED Indicator Settings	
LED Color	Definition
On	System Functions Normally
Off	System abnormal

5-10 Installing Software

After the hardware has been installed, you should first install the operating system and then the drivers. The necessary drivers are all included on the Supermicro CDs that came packaged with your motherboard.



Driver/Tool Installation Display Screen

Note: Click the icons showing a hand writing on paper to view the readme files for each item. Click the computer icons to the right of these items to install each item (from top to the bottom) one at a time. **After installing each item, you must re-boot the system before moving on to the next item on the list.** The bottom icon with a CD on it allows you to view the entire contents of the CD.

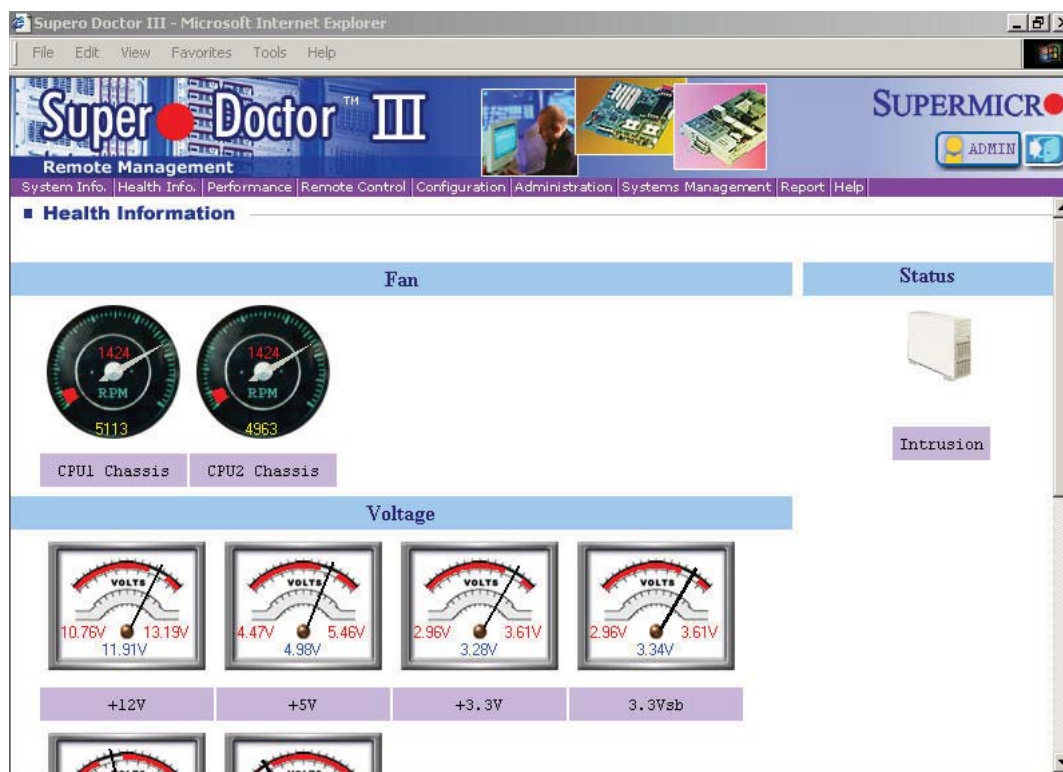
SuperDoctor III

The SuperDoctor III program is a web-based management tool that supports remote management capability. It includes Remote and Local Management tools. The local management is called SD III Client. The SuperDoctor III program included on the CD-ROM that came with your motherboard allows you to monitor the environment and operations of your system. SuperDoctor III displays crucial system information such as CPU temperature, system voltages and fan status. See the Figure below for a display of the SuperDoctor III interface.

Note: The default User Name and Password for SuperDoctor III is ADMIN / ADMIN.

Note: When SuperDoctor III is first installed, it adopts the temperature threshold settings that have been set in BIOS. Any subsequent changes to these thresholds must be made within Super Doctor, as the Super Doctor settings override the BIOS settings. To set the BIOS temperature threshold settings again, you would first need to uninstall SuperDoctor III.

SuperDoctor III Interface Display Screen (Health Information)



SuperDoctor III Interface Display Screen (Remote Control)



Note: SuperDoctor III Software Revision 1.0 can be downloaded from our Web Site at: ftp://ftp.supermicro.com/utility/Supero_Doctor_III/. You can also download the SDIII User's Guide at: <http://www.supermicro.com/PRODUCT/Manuals/SDIII/UserGuide.pdf>. For Linux, we will recommend using Supero Doctor II.

Notes

Chapter 6

Advanced Chassis Setup

This chapter covers the steps required to install components and perform maintenance on the SC937 chassis. For component installation, follow the steps in the order given to eliminate the most common problems encountered. If some steps are unnecessary, skip ahead to the step that follows.

Tools Required: The only tool you will need to install components and perform maintenance is a Philips screwdriver.

6-1 Static-Sensitive Devices

Electrostatic Discharge (ESD) can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully. The following measures are generally sufficient to protect your equipment from ESD damage.

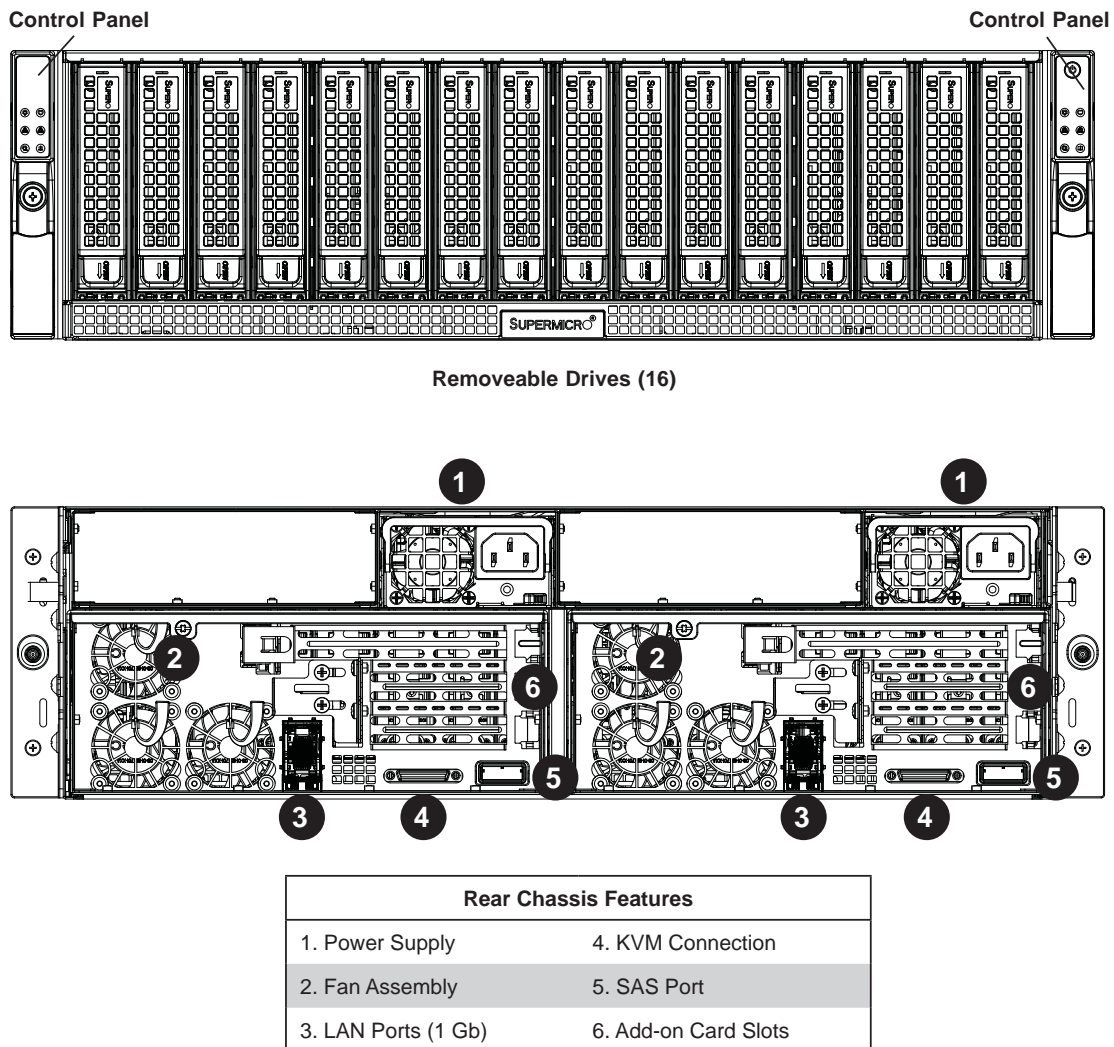
Precautions

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing any board from its antistatic bag.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the serverboard, add-on cards and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the serverboard.

Unpacking

The serverboard is shipped in antistatic packaging to avoid static damage. When unpacking the board, make sure the person handling it is static protected.

Figure 6-1. Front and Rear Chassis Views



6-2 Control Panel

The control panels are connected to the serverboards through the midplane. The LEDs on the control panels are associated with the node on the same side of the chassis. Note that only the right-side control panel includes a power button. Depressing this button will turn both nodes on or off.

See Chapter 3 for details on the LEDs and the control panel buttons.

6-3 System Fans

System cooling is provided by three sets of counter-rotating fans on each serverboard as well as an assembly that holds three fans near the front of the node. Each fan assembly (one for each node) consists of three sets of counter-rotating fans. The counter-rotating action helps dampen vibration levels while generating exceptional airflow.

It is very important that the chassis cover is properly installed and making a good seal for the cooling air to circulate properly through the chassis and cool the components.

System Fan Failure

Fan speed is controlled by system temperature via a BIOS setting. If a fan fails, the remaining fans will ramp up to full speed and the overheat/fan fail LED on the control panel (of the same side as the failed fan) will turn on. The counter-rotating fans may also be visually inspected for failure. Replace any failed fan at your earliest convenience with the same type and model (the system can continue to run with a failed fan). Remove the top chassis cover while the system is still running to determine which of the fans has failed.

Replacing System Fans

Replace the failed fan with an identical 4-cm, 12-volt counter-rotating fan (p/n FAN-0088L4, available from Supermicro). See Figures 6-2 and 6-3.

Replacing Fans

1. Shutdown the node with the failed fan(s) and remove the AC power cord.
2. On the node with the failed fan, push the release bar down to unlock the serverboard tray.
3. Use the bar to pull the node/serverboard from the chassis.
4. Remove the failed fan from the assembly and replace it with an identical replacement. You may need to remove the assembly to replace the lower fan.
5. Slide the serverboard tray back into the chassis. When seated, lift the release bar to lock it into place.
6. Reconnect the AC power cord and power up the node.
7. Inspect the replaced fan to verify it is working.

Figure 6-2. Replacing a Serverboard Fan

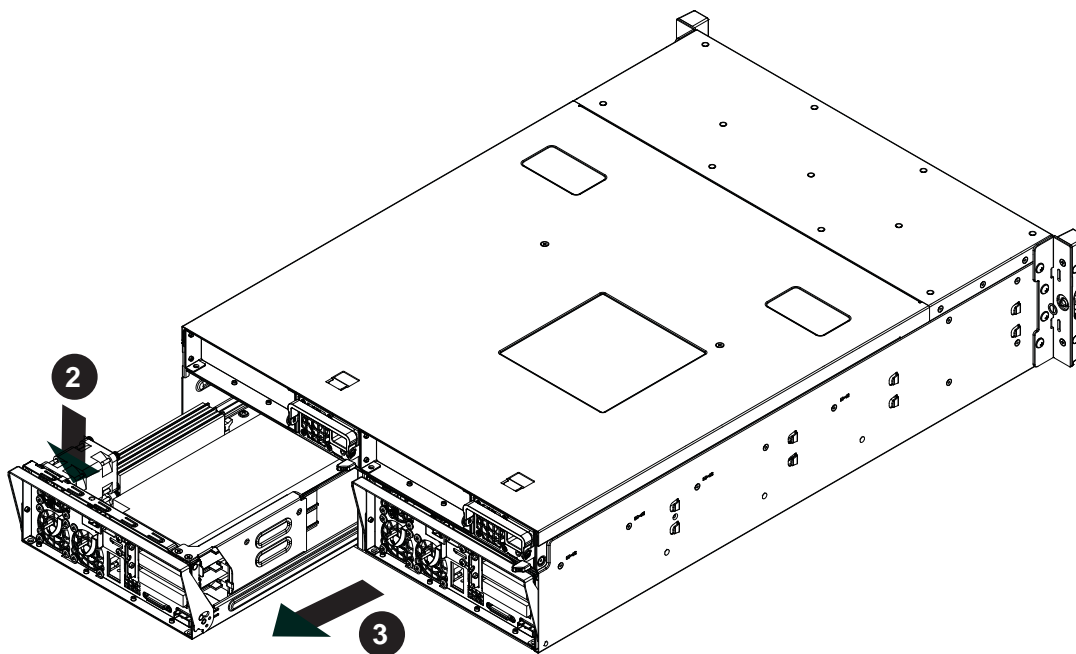
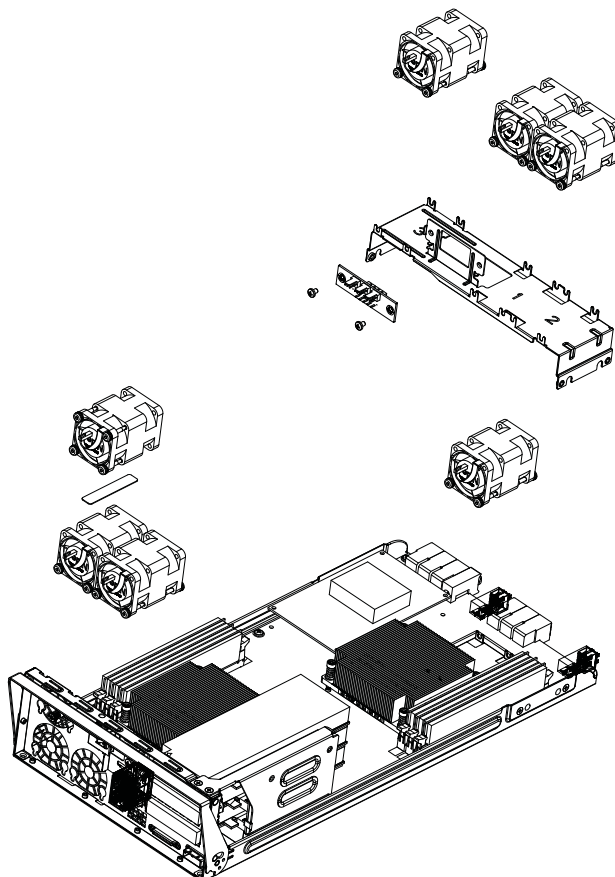


Figure 6-3. Exploded View of Fan Assembly



6-4 Drive Bay Installation/Removal

Accessing the Drive Bays

SAS/SATA Drives: You do not need to access the inside of the chassis or remove power to replace or swap SAS/SATA drives. Proceed to the next step for instructions. You must use standard 1" high, SAS drives in the system.

Note: Special add-on cards installed in the drive carriers provide support for SATA drives. Each carrier must have one AOC-LSISS9252 card installed to support a SATA drive.

Note: Refer to the following ftp site for setup guidelines: <ftp://ftp.supermicro.com/driver/SAS/LSI/LSI_SAS_EmbMRAID_SWUG.pdf> and Supermicro's web site for additional information < <http://www.supermicro.com/support/manuals/>>.

Hard Drive Midplane

The hard drives plug into a midplane that provides power, drive ID and bus termination. A RAID controller can be used with the midplane to provide data security. The operating system you use must have RAID support to enable the hot-swap capability of the hard drives. The midplane is already preconfigured, so no jumper or switch configurations are required.

SAS 2.0 Controller

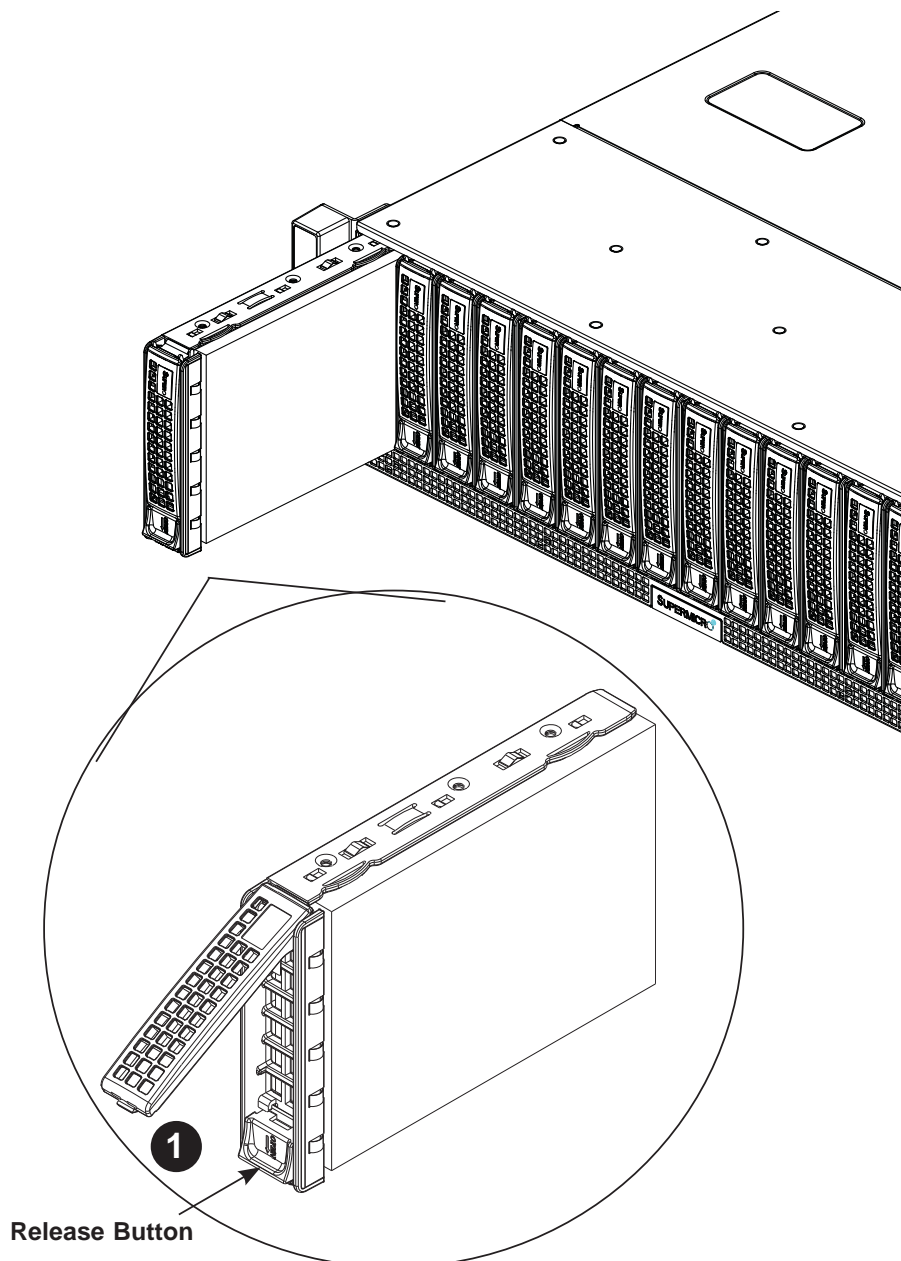
The SAS 2.0 controller (LSI 2008) is located on a mezzanine card (AOM-SAS2-L8) that plugs into the "SAS 2 Controller Card" slot (see serverboard layout diagram for location).

SAS/SATA Drive Installation

These drives are mounted in drive carriers to simplify their installation and removal from the chassis. The carriers also help promote proper airflow for the drives. For this reason, even empty carriers without hard drives installed must remain in the chassis.

Removing a HDD Carrier from the Chassis (Figure 6-4)

1. Press the release button on the drive tray. This extends the drive tray handle.
2. Use the handle to pull the drive out of the chassis.

Figure 6-4. Removing a HDD Carrier from the Chassis

Enterprise level hard disk drives are recommended for use in Supermicro chassis and servers. For information on recommended HDDs, visit the Supermicro Web site at <http://www.supermicro.com/products/nfo/files/storage/SAS-1-CompList-110909.pdf>



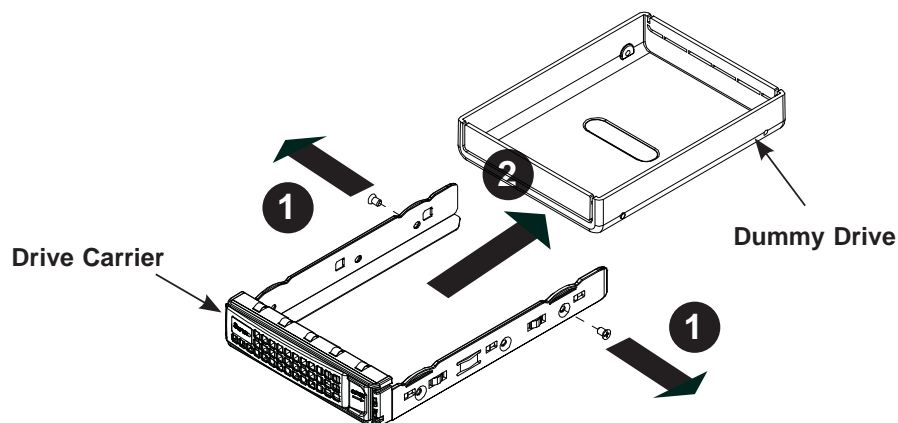
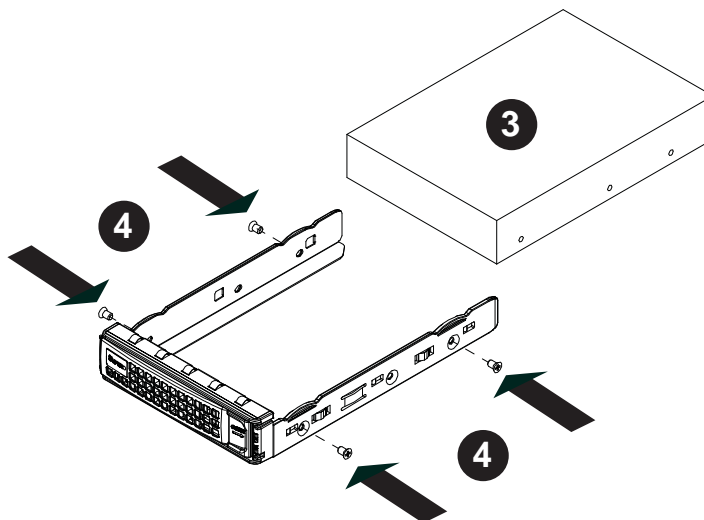
Use caution when working around the midplane. Do not touch the midplane with any metal objects and make sure no cables touch the midplane or obstruct the holes, which aid in proper airflow.



Important: Regardless of how many hard drives are installed, all drive carriers must remain in the drive bays to maintain proper airflow.

Installing a SAS/SATA Hard Drive (Figures 6-5 and 6-6)

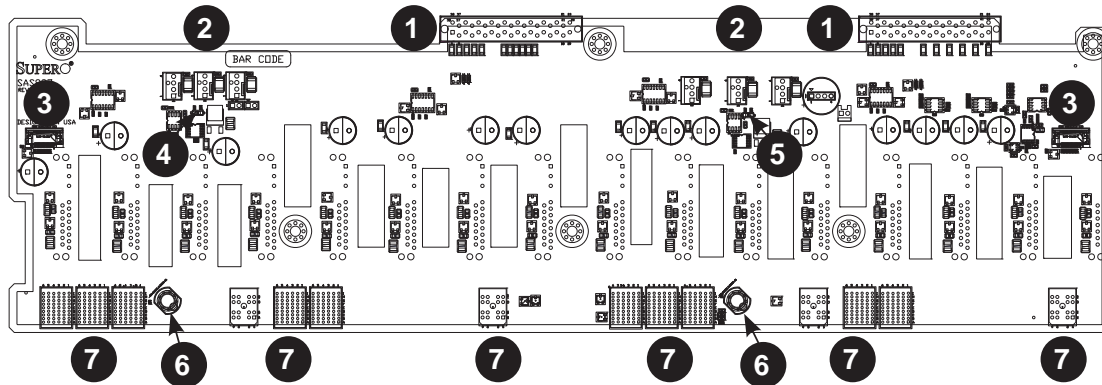
1. Remove the screws securing the dummy drive to the drive carrier.
2. Remove the dummy drive. Place the carrier on a flat surface.
3. SATA drives only: install an AOC-LSISS9252 interposer add-on card into the carrier.
4. Slide the hard drive into the carrier with the printed circuit board side down.
5. Carefully align the mounting holes in both the drive tray and the hard drive.
6. Secure the hard drive to the tray using the screws provided.
7. Insert the drive carrier into the chassis. Make sure to close the carrier handle to lock the carrier into place.

Figure 6-5. Removing the Dummy Drive from the Carrier**Figure 6-6. Installing a Drive to a Carrier**

6-5 Midplane

The midplane supplies power and logic to the hard drives as well as other parts of the system. See Figure 6-7 below for a list of connections to the midplane.

Figure 6-7. Midplane Connections



Item	Description	Connects To
1.	Power Connections	Power Distribution Board
2.	Fan Headers (3 each)	Fan Assemblies (1 for each node)
3.	Control Panel Connections	Control Panel
4.	Overheat LED (for right-side node)	N/A
5.	Overheat LED (for left-side node)	N/A
6.	Node Present/Absent Sensor	Node/Serverboard
7.	SBB (Storage Bridge Bay) Connections	Node/Serverboard

6-6 Power Supply

The SuperServer 6036ST-6LR has a 1200 watt redundant power supply consisting of two separate power modules. Each power supply module has an auto-switching capability, which enables it to automatically sense and operate at a 100V - 240V input voltage.

When fully inserted into the chassis, the power supplies connect automatically to a power distribution board (PDB). The PDB in turn connects to the midplane via two black power connectors as shown in Figure 6-7.

Power Supply Failure

If either of the two power supply modules fail, the other module will take the full load and allow the system to continue operation without interruption. The PWR Fail LED will illuminate and remain on until the failed unit has been replaced. Replacement units can be ordered directly from Supermicro. The power supply units have a hot-swap capability, meaning you can replace the failed unit without powering down the system.

Replacing the Power Supply

You do not need to shut down the system to replace a power supply unit. The backup power supply module will keep the system up and running while you replace the failed hot-swap unit. Replace with the same model (see part number in the Appendix), which can be ordered directly from Supermicro.

Replacing the Power Supply

1. The SC937 chassis includes a redundant power supply (at least two power modules), you can leave the server running if you remove only one power supply at a time.
2. Unplug the power supply that you will replace.
3. Push the release tab (on the back of the power supply) as illustrated.
4. Pull the power supply out using the handle provided.
5. Replace the failed power module with the same model.
6. Push the new power supply module into the power bay until you hear a click.
7. Plug the AC power cord back into the module and power up the server.

Notes

Chapter 7

BIOS

7-1 Introduction

This chapter describes the AMI BIOS Setup Utility for the X8DTS-F. The AMI ROM BIOS is stored in a Flash EEPROM and can be easily updated. This chapter describes the basic navigation of the AMI BIOS Setup Utility setup screens.

Starting the BIOS Setup Utility

To enter the AMI BIOS Setup Utility screens, press the <Delete> key while the system is booting up.



Note: In most cases, the <Delete> key is used to invoke the AMI BIOS setup screen. There are a few cases when other keys are used, such as <F1>, <F2>, etc.

Each main BIOS menu option is described in this manual. The Main BIOS setup menu screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured. Options in blue can be configured by the user. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it. (**Note:** the AMI BIOS has default text messages built in. Supermicro retains the option to include, omit, or change any of these text messages.)

The AMI BIOS Setup Utility uses a key-based navigation system called "hot keys". Most of the AMI BIOS setup utility "hot keys" can be used at any time during the setup navigation process. These keys include <F1>, <F10>, <Enter>, <ESC>, arrow keys, etc.



Note: Options printed in **Bold** are default settings.

How To Change the Configuration Data

The configuration data that determines the system parameters may be changed by entering the AMI BIOS Setup utility. This Setup utility can be accessed by pressing at the appropriate time during system boot.



Note: For AMI BIOS Recovery, please refer to the AMI BIOS Recovery Instructions posted on our website at <http://www.supermicro.com/support/manuals/>.

Starting the Setup Utility

Normally, the only visible Power-On Self-Test (POST) routine is the memory test. As the memory is being tested, press the <Delete> key to enter the main menu of the AMI BIOS Setup Utility. From the main menu, you can access the other setup screens. An AMI BIOS identification string is displayed at the left bottom corner of the screen below the copyright message.



Warning! Do not upgrade the BIOS unless your system has a BIOS-related issue. Flashing the wrong BIOS can cause irreparable damage to the system. In no event shall Supermicro be liable for direct, indirect, special, incidental, or consequential damages arising from a BIOS update. If you have to update the BIOS, do not shut down or reset the system while the BIOS is updating. This is to avoid possible boot failure.

7-2 Main Setup

When you first enter the AMI BIOS Setup Utility, you will enter the Main setup screen. You can always return to the Main setup screen by selecting the Main tab on the top of the screen. The Main BIOS Setup screen is shown below.

BIOS SETUP UTILITY	
Main	Advanced Security Boot Exit
System Overview <hr/> System Time [12:25:34] System Date [Thu 10/01/2009] Supermicro X8DTS BIOS Build Ver :0.56 BIOS Build Date :08/25/09 AMIBIOS Core Ver:08.00.16 Processor Intel(R) Xeon(R) CPU X5550 @ 2.67GHz Speed :2666MHz Physical Count :1 Logical Count :8 Microcode Rev :B System Memory Size :6136MB	
Use [ENTER], [TAB] or [SHIFT-TAB] to select a field. Use [+] or [-] to configure system Time. + Select Screen ↑↓ Select Item +- Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit	
v02.67 (C) Copyright 1985-2009, American Megatrends, Inc.	

System Overview: The following BIOS information will be displayed:

System Time/System Date

Use this option to change the system time and date. Highlight *System Time* or *System Date* using the arrow keys. Key in new values through the keyboard and press <Enter>. Press the <Tab> key to move between fields. The date must be entered in Day MM/DD/YY format. The time is entered in HH:MM:SS format. (**Note:** The time is in the 24-hour format. For example, 5:30 P.M. appears as 17:30:00.)

Supermicro X8DTS-F-F

- **BIOS Build Version:** This item displays the BIOS revision used in your system.
- **BIOS Build Date:** This item displays the date when this BIOS was completed.
- **AMI BIOS Core Version:** This item displays the revision number of the AMI BIOS Core upon which your BIOS was built.

Processor

The AMI BIOS will automatically display the status of the processor used in your system:

- **CPU Type:** This item displays the type of CPU used in the motherboard.
- **Speed:** This item displays the speed of the CPU detected by the BIOS.
- **Physical Count:** This item displays the number of processors installed in your system as detected by the BIOS.
- **Logical Count:** This item displays the number of CPU Cores installed in your system as detected by the BIOS.
- **Microcode Revision:** This item displays the revision number of the BIOS Microcode used in your system.

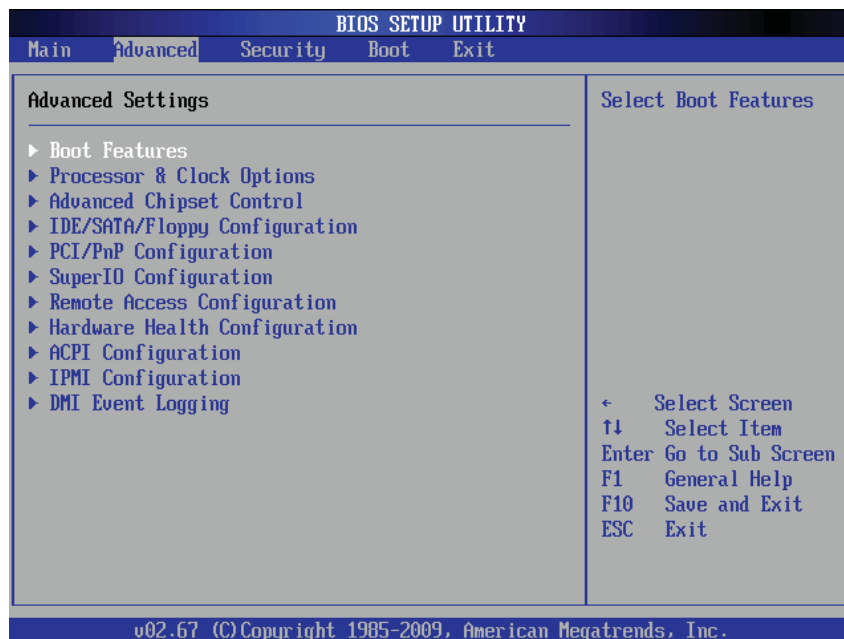
System Memory

This displays the size of memory available in the system:

- **Size:** This item displays the memory size detected by the BIOS.

7-3 Advanced Setup Configurations

Use the arrow keys to select Boot Setup and press <Enter> to access the submenu items:



► Boot Features

Quick Boot

If Enabled, this option will skip certain tests during POST to reduce the time needed for system boot. The options are **Enabled** and Disabled.

Quiet Boot

This option allows the bootup screen options to be modified between POST messages or the OEM logo. Select Disabled to display the POST messages. Select Enabled to display the OEM logo instead of the normal POST messages. The options are **Enabled** and Disabled.

AddOn ROM Display Mode

This sets the display mode for Option ROM. The options are **Force BIOS** and Keep Current.

Bootup Num-Lock

This feature selects the Power-on state for the Numlock key. The options are Off and **On**.

Wait For 'F1' If Error

This forces the system to wait until the 'F1' key is pressed if an error occurs. The options are Disabled and **Enabled**.

Hit 'Del' Message Display

This feature displays "Press DEL to run Setup" during POST. The options are **Enabled** and Disabled.

Interrupt 19 Capture

Interrupt 19 is the software interrupt that handles the boot disk function. When this item is set to Enabled, the ROM BIOS of the host adaptors will "capture" Interrupt 19 at boot and allow the drives that are attached to these host adaptors to function as bootable disks. If this item is set to Disabled, the ROM BIOS of the host adaptors will not capture Interrupt 19, and the drives attached to these adaptors will not function as bootable devices. The options are **Enabled** and Disabled.

Power Configuration

Power Button Function

If this feature is set to Instant_Off, the system will power off immediately as soon as the user presses the power button. If this feature is set to 4_Second_Override, the system will power off when the user presses the power button for 4 seconds or longer. The options are **Instant_Off** and 4_Second_Override.

Restore on AC Power Loss

Use this feature to set the power state after a power outage. Select Power-Off for the system power to remain off after a power loss. Select Power-On for the system power to be turned on after a power loss. Select Last State to allow the system to resume its last state before a power loss. The options are Power-On, Power-Off and **Last State**.

Watch Dog Timer

If enabled, the Watch Dog Timer will allow the system to reboot when it is inactive for more than 5 minutes. The options are Enabled and **Disabled**.

►Processor & Clock Options

This submenu allows the user to configure the Advanced Processor and Clock settings.

CPU Ratio

This option allows the user to set the ratio between the CPU Core Clock and the FSB Frequency. (**Note:** if an invalid ratio is entered, the AMI BIOS will restore the setting to the previous state.) The default setting depends on the type of CPU installed on the motherboard. The options are **Auto** and Manual.

C1E Support

Select Enabled to enable Enhanced Halt State support. C1E significantly reduces the CPU's power consumption by reducing the CPU's clock cycle and voltage during a "Halt State." The options are Disabled and **Enabled**.

Hardware Prefetcher (Available when supported by the CPU)

If this feature is set to Enabled, the hardware prefetcher will prefetch streams of data and instructions from the main memory to the L2 cache to improve CPU performance. The options are Disabled and **Enabled**.

Adjacent Cache Line Prefetch (Available when supported by the CPU)

The CPU prefetches the cache line for 64 bytes if this option is set to Disabled. The CPU fetches both cache lines for 128 bytes as comprised if **Enabled**.

Intel® Virtualization Technology (Available when supported by the CPU)

Select Enabled to use the feature of Virtualization Technology and allow one platform to run multiple operating systems and applications in independent partitions, creating multiple "virtual" systems in one physical computer. The options are **Enabled** and Disabled. **Note:** If there is any change to this setting, you will need to power off and restart the system for the change to take effect. Please refer to Intel's web site for detailed information.

Execute-Disable Bit Capability (Available when supported by the OS and the CPU)

Select Enabled to enable the Execute Disable Bit which will allow the processor to designate areas in the system memory where an application code can execute and where it cannot, thus preventing a worm or a virus from flooding illegal codes to overwhelm the processor or damage the system during an attack. The default is **Enabled**. (Refer to Intel and Microsoft Web Sites for more information.)

Simultaneous Multi-Threading (Available when supported by the CPU)

Set to Enabled to use the Simultaneous Multi-Threading Technology, which will result in increased CPU performance. The options are Disabled and **Enabled**.

Active Processor Cores

Set to Enabled to use a processor's Second Core and beyond. (Please refer to Intel's web site for more information.) The options are **All**, 1 and 2.

Intel® EIST Technology

EIST (Enhanced Intel SpeedStep Technology) allows the system to automatically adjust processor voltage and core frequency in an effort to reduce power consumption.

tion and heat dissipation. **Please refer to Intel's web site for detailed information.** The options are Disable (Disable GV3) and **Enable (Enable GV3)**.

Intel® TurboMode Technology (Available when Intel® EIST Technology is enabled)

Select Enabled to use the Turbo Mode to boost system performance. The options are **Enabled** and Disabled.

Intel® C-STATE Tech

If enabled, C-State is set by the system automatically to either C2, C3 or C4 state. The options are Disabled and **Enabled**.

C-State package limit setting (Available if Intel® C-State Tech is enabled)

If set to Auto, the AMI BIOS will automatically set the limit on the C-State package register. The options are **Auto**, C1, C3, C6 and C7.

C1 Auto Demotion

When enabled, the CPU will conditionally demote C3, C6 or C7 requests to C1 based on un-core auto-demote information. The options are Disabled and **Enabled**.

C3 Auto Demotion

When enabled, the CPU will conditionally demote C6 or C7 requests to C3 based on un-core auto-demote information. The options are Disabled and **Enabled**.

Clock Spread Spectrum

Select Enable to use the feature of Clock Spectrum, which will allow the BIOS to monitor and attempt to reduce the level of Electromagnetic Interference caused by the components whenever needed. The options are **Disabled** and Enabled.

► **Advanced Chipset Control**

The items included in the Advanced Settings submenu are listed below:

► **CPU Bridge Configuration**

QPI (Quick Path Interconnect) Links Speed

This feature selects data transfer speed for QPI Link connections. The options are Slow-Mode, and **Full Speed**.

QPI Frequency (Available if the item - QPI Speed is set to Full Speed)

This feature allows the user to select the desired QPI frequency. The options are **Auto**, 4.800 GT, 5.866GT, 6.400 GT.

QPI L0s and L1

This feature allows the user to set the QPI power state to a low setting. L0s and L1 are automatically selected by the motherboard. The options are Disabled and **Enabled**.

Memory Frequency

This feature forces a DDR3 frequency slower than what the system has detected. The available options are **Auto**, Force DDR-800, Force DDR-1066, Force DDR-1333 and Force SPD.

Memory Mode

The options are **Independent**, Channel Mirror, and Lockstep.

Independent - All DIMMs are available to the operating system.

Channel Mirror - The motherboard maintains two identical copies of all data in memory for redundancy.

Lockstep - The motherboard uses two areas of memory to run the same set of operations in parallel.

Demand Scrubbing

Demand Scrubbing is a memory error-correction scheme that allows the processor to write corrected data back into the memory block from where it was read by the Processor. The options are Enabled and **Disabled**.

Patrol Scrubbing

Select Enabled to use Patrol Scrubbing, which is a memory error-correction scheme that works in the background looking for and correcting resident errors. The options are Enabled and **Disabled**.

Throttling - Closed Loop/Throttling - Open Loop

Throttling improves reliability and reduces power in the processor by automatic voltage control during processor idle states. Available options are **Disabled** and Enabled. If Enabled, the following items will appear:

Hysteresis Temperature (Available for Closed Loop only)

Temperature Hysteresis is the temperature lag (in degrees Celsius) after the set DIMM temperature threshold is reached before Closed Loop Throttling begins. The options are Disabled, **1.5°C**, 3.0°C, and 6.0°C.

Guardband Temperature (Available for Closed Loop only)

This is the temperature which applies to the DIMM temperature threshold. Each step is in 0.5°C increments. The default is **[006]**. Press <+> or <-> on your keyboard to change this value.

Inlet Temperature

This is the temperature detected at the chassis inlet. Each step is in 0.5°C increment. The default is **[070]**. Press <+> or <-> on your keyboard to change this value.

Temperature Rise

This is the temperature rise to the DIMM thermal zone. Each step is in 0.5°C increment. The default is **[020]**. Press <+> or <-> on your keyboard to change this value.

Air Flow

This is the air flow speed to the DIMM modules. Each step is one mm/sec. The default is **[1500]**. Press <+> or <-> on your keyboard to change this value.

Altitude

This feature defines how many meters above or below sea level the system is located. The options are **Sea Level or Below**, 1~300, 301~600, 601~900, 901~1200, 1201~1500, 1501~1800, 1801~2100, 2101~2400, 2401~2700, 2701~3000.

DIMM Pitch

This is the physical space between each DIMM module. Each step is in 1/1000 of an inch. The default is **[400]**. Press <+> or <-> on your keyboard to change this value.

Serial Debug Message Level

This feature allows the user to set the level of debug messages to be displayed. The options are **None**, MIN, MAX and Test.

Margin Ranks

Select Enabled to create proper memory margin for each rank based on the status of Rx DQ, Tx DQ, Rx Vref and Tx Vref. The options are **Disabled** and Enabled.

►North Bridge Configuration

This feature allows the user to configure the settings for the Intel North Bridge.

Crystal Beach/DMA (Direct Memory Access)

This feature works with the Intel I/O AT (Acceleration Technology) to accelerate the performance of TOE devices. (**Note:** A TOE device is a specialized, dedicated processor that is installed on an add-on card or a network card to handle some

or all packet processing of this add-on card.) When this feature is set to Enabled, it will enhance overall system performance by providing direct memory access for data transferring. The options are Enabled and **Disabled**.

Crystal Beach/DCA (Direct Cache Access) (Available when Crystal Beach/DMA is enabled)

This feature works in conjunction with the Intel I/O AT (Acceleration Technology) to accelerate the performance of the TOE device. When this feature set to Enabled, it will enhance overall system performance by providing direct cache access for data transferring. The options are Enabled and **Disabled**.

Coarse-Grained Clock Gating

Select Enabled to enable Coarse-Grained Clock Gating support, which will allow Data to be communicated infrequently (only after larger amounts of computation) in an effort to lower power consumption. The options are **Enabled** and Disabled.

Intel VT-d

Select Enabled to enable Intel's Virtualization Technology support for Direct I/O VT-d by reporting the I/O device assignments to VMM through the DMAR ACPI Tables. This feature offers fully-protected I/O resource-sharing across the Intel platforms, providing the user with greater reliability, security and availability in networking and data-sharing. The settings are Enabled and **Disabled**.

IOH PCIE Max Payload Size

Some add-on cards perform faster with the coalesce feature, which limits the payload size to 128 MB; while others, with a payload size of 256 MB which inhibits the coalesce feature. Please refer to your add-on card user guide for the desired setting. The options are 256 MB and **128MB**.

►South Bridge Configuration

This feature allows the user to configure the settings for the Intel South Bridge.

USB Functions

This feature allows the user to decide the number of onboard USB ports to be enabled. The Options are: Disabled, and **Enabled**. (If this item is set to Enabled, USB 2.0 Controller will be enabled.)

Legacy USB Support

Select Enabled to use Legacy USB devices. If this item is set to Auto, Legacy USB support will be automatically enabled if a legacy USB device is installed on the motherboard, and vise versa. The settings are Disabled, **Enabled** and Auto.

USB 2.0 Controller

Select Enabled to activate USB 2.0 Controller. The options are **Enabled** and Disabled. (**Note:** If the item - USB Functions is enabled, USB 2.0 Controller will always be enabled. When the item - USB Functions is set to Disabled, the user has the option to enable or disable USB 2.0 Controller.)

USB 2.0 Controller Mode

This setting allows you to select the USB 2.0 Controller mode. The options are **Hi-Speed (480 Mbps)** and Full Speed (12 Mbps).

BIOS EHCI Hand-Off

Select Enabled to enable BIOS Enhanced Host Controller Interface support to provide a workaround solution for an operating system that does not have EHCI Hand-Off support. When enabled, the EHCI Interface will be changed from the BIOS-controlled to the OS-controlled. The options are Disabled and **Enabled**.

►IDE/SATA/Floppy Configuration

When this submenu is selected, the AMI BIOS automatically detects the presence of the IDE devices and displays the following items.

SATA#1 Configuration

If Compatible is selected, it sets SATA#1 to legacy compatibility mode, while selecting Enhanced sets SATA#1 to native SATA mode. The options are Disabled, Compatible and **Enhanced**.

Configure SATA#1 as

This feature allows the user to select the drive type for SATA#1. The options are **IDE**, RAID and AHCI. (When the option-RAID is selected, the item-ICH RAID Code Base will appear.)

ICH RAID Code Base (This feature is available when the option-RAID is selected)

Select Intel to enable Intel's SATA RAID firmware to configure Intel's SATA RAID settings. Select Adaptec to enable Adaptec's SATA RAID firmware to configure Adaptec's SATA RAID settings. The options are **Intel** and Adaptec.

Primary IDE Master

These settings allow the user to set the parameters of the IDE slots as specified. Press <Enter> to activate the following submenu items. Set the correct configurations accordingly.

Type

Select the type of device connected to the system. The options are Not Installed, **Auto**, CD/DVD and ARMD.

LBA/Large Mode

LBA (Logical Block Addressing) is a method of addressing data on a disk drive. In the LBA mode, the maximum drive capacity is 137 GB. For drive capacities over 137 GB, your system must be equipped with a 48-bit LBA mode addressing. If not, contact your manufacturer or install an ATA/133 IDE controller card that supports 48-bit LBA mode. The options are Disabled and **Auto**.

Block (Multi-Sector Transfer)

Block Mode boosts the IDE drive performance by increasing the amount of data transferred. Only 512 bytes of data can be transferred per interrupt if Block Mode is not used. Block Mode allows transfers of up to 64 KB per interrupt. Select Disabled to allow data to be transferred from and to the device one sector at a time. Select Auto to allow data transfer from and to the device occur multiple sectors at a time if the device supports it. The options are **Auto** and Disabled.

PIO Mode

The IDE PIO (Programmable I/O) Mode programs timing cycles between the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases. The options are **Auto**, 0, 1, 2, 3, and 4. Select Auto to allow the AMI BIOS to automatically detect the PIO mode. Use this value if the IDE disk drive support cannot be determined.

Select 0 to allow the AMI BIOS to use PIO mode 0. It has a data transfer rate of 3.3 MB/s.

Select 1 to allow the AMI BIOS to use PIO mode 1. It has a data transfer rate of 5.2 MB/s.

Select 2 to allow the AMI BIOS to use PIO mode 2. It has a data transfer rate of 8.3 MB/s.

Select 3 to allow the AMI BIOS to use PIO mode 3. It has a data transfer rate of 11.1 MB/s.

Select 4 to allow the AMI BIOS to use PIO mode 4. It has a data transfer bandwidth of 32-Bits. Select Enabled to enable 32-Bit data transfer.

DMA Mode

Select Auto to allow the BIOS to automatically detect IDE DMA mode when the IDE disk drive support cannot be determined.

Select SWDMA0 to allow the BIOS to use Single Word DMA mode 0. It has a data transfer rate of 2.1 MB/s.

Select SWDMA1 to allow the BIOS to use Single Word DMA mode 1. It has a data transfer rate of 4.2 MB/s.

Select SWDMA2 to allow the BIOS to use Single Word DMA mode 2. It has a data transfer rate of 8.3 MB/s.

Select MWDMA0 to allow the BIOS to use Multi Word DMA mode 0. It has a data transfer rate of 4.2 MB/s.

Select MWDMA1 to allow the BIOS to use Multi Word DMA mode 1. It has a data transfer rate of 13.3 MB/s.

Select MWDMA2 to allow the BIOS to use Multi-Word DMA mode 2. It has a data transfer rate of 16.6 MB/s.

Select UDMA0 to allow the BIOS to use Ultra DMA mode 0. It has a data transfer rate of 16.6 MB/s. It has the same transfer rate as PIO mode 4 and Multi Word DMA mode 2.

Select UDMA1 to allow the BIOS to use Ultra DMA mode 1. It has a data transfer rate of 25 MB/s.

Select UDMA2 to allow the BIOS to use Ultra DMA mode 2. It has a data transfer rate of 33.3 MB/s.

Select UDMA3 to allow the BIOS to use Ultra DMA mode 3. It has a data transfer rate of 66.6 MB/s.

Select UDMA4 to allow the BIOS to use Ultra DMA mode 4. It has a data transfer rate of 100 MB/s.

Select UDMA5 to allow the BIOS to use Ultra DMA mode 5. It has a data transfer rate of 133 MB/s.

Select UDMA6 to allow the BIOS to use Ultra DMA mode 6. It has a data transfer rate of 133 MB/s. The options are **Auto**, SWDMA_n, MWDMA_n, and UDMA_n.

S.M.A.R.T. For Hard disk drives

Self-Monitoring Analysis and Reporting Technology (SMART) can help predict impending drive failures. Select Auto to allow the AMI BIOS to automatically detect hard disk drive support. Select Disabled to prevent the AMI BIOS from using the S.M.A.R.T. Select Enabled to allow the AMI BIOS to use the S.M.A.R.T. to support hard drive disk. The options are Disabled, Enabled, and **Auto**.

32Bit Data Transfer

Select **Enabled** to enable the function of 32-bit IDE data transfer. The options are **Enabled** and **Disabled**.

IDE Detect Timeout (sec)

Use this feature to set the time-out value for the BIOS to detect the ATA, ATAPI devices installed in the system. The options are 0 (sec), 5, 10, 15, 20, 25, 30, and **35**.

►PCI/PnP Configuration

Clear NVRAM

This feature clears the NVRAM (Non-Volatile Random Access Memory) during system boot. The options are **No** and **Yes**.

Plug & Play OS

Selecting **Yes** allows the OS to configure Plug & Play devices. (This is not required for system boot if Plug & Play is supported by your OS.) Select **No** to allow the AMI BIOS to configure all devices in the system.

PCI Latency Timer

This feature sets the latency Timer of each PCI device installed on a PCI bus. Select **64** to set the PCI latency to 64 PCI clock cycles. The options are 32, **64**, 96, 128, 160, 192, 224 and 248.

PCI IDE BusMaster

When enabled, the BIOS uses PCI bus mastering for reading/writing to IDE drives. The options are **Disabled** and **Enabled**.

Load Onboard LAN1 Option ROM/Load Onboard LAN2 Option ROM

Select **Enabled** to enable the onboard LAN1 or LAN2 Option ROM. This is to boot computer using a network interface. The options are **Enabled** and **Disabled**.

►Super IO Device Configuration

Serial Port1 Address

This option specifies the base I/O port address and the Interrupt Request address of Serial Port 1. Select **Disabled** to prevent the serial port from accessing any system resources. When this option is set to **Disabled**, the serial port physically becomes unavailable. Select **3F8/IRQ4** to allow the serial port to use 3F8 as its I/O port address and IRQ 4 for the interrupt address. The options are **Disabled**, **3F8/IRQ4**, **3E8/IRQ4**, **2E8/IRQ3**.

► Remote Access Configuration

Remote Access

This allows the user to enable or disable Remote Access support. The options are Disabled and **Enabled**. If this item is Enabled, the following items will display:

Serial Port Number

This feature allows the user decide which serial port to be used for Console Redirection. The options are COM 1 and **COM 2**.

Base Address, IRQ

This item displays the based address and IRQ of the serial port specified above. The default setting is **2F8h, 3**.

Serial Port Mode

This feature allows the user to set the serial port mode for Console Redirection. The options are **115200 8, n 1**; 57600 8, n, 1; 38400 8, n, 1; 19200 8, n, 1; and 9600 8, n, 1.

Flow Control

This feature allows the user to set the flow control for Console Redirection. The options are **None**, Hardware, and Software.

Redirection After BIOS POST

Select Disabled to turn off Console Redirection after Power-On Self-Test (POST). Select Always to keep Console Redirection active all the time after POST. (Note: This setting may not be supported by some operating systems.) Select Boot Loader to keep Console Redirection active during POST and Boot Loader. The options are Disabled, Boot Loader, and **Always**.

Terminal Type

This feature allows the user to select the target terminal type for Console Redirection. The options are **ANSI**, VT100, and VT-UTF8.

VT-UTF8 Combo Key Support

A terminal keyboard definition that provides a way to send commands from a remote console. Available options are **Enabled** and Disabled.

Sredir Memory Display Delay

This feature defines the length of time in seconds to display memory information. The options are **No Delay**, Delay 1 Sec, Delay 2 Sec, and Delay 4 Sec.

► Hardware Health Configuration

This feature allows the user to monitor system health and review the status of each item as displayed.

CPU Overheat Alarm

This option allows the user to select the CPU Overheat Alarm setting which determines when the CPU OH alarm will be activated to provide warning of possible CPU overheat.

Warning! 1. Any temperature that exceeds the CPU threshold temperature predefined by the CPU manufacturer may result in CPU overheat or system instability. When the CPU temperature reaches this predefined threshold, the CPU and system cooling fans will run at full speed. 2. To avoid possible system overheating, please be sure to provide adequate airflow to your system.



The options are:

- **The Early Alarm:** Select this setting if you want the CPU overheat alarm (including the LED and the buzzer) to be triggered as soon as the CPU temperature reaches the CPU overheat threshold as predefined by the CPU manufacturer.
- **The Default Alarm:** Select this setting if you want the CPU overheat alarm (including the LED and the buzzer) to be triggered when the CPU temperature reaches about 5°C above the threshold temperature as predefined by the CPU manufacturer to give the CPU and system fans additional time needed for CPU and system cooling. In both the alarms above, please take immediate action as shown below.

CPU 1 Temperature/CPU 2 Temperature/System Temperature

This feature displays current temperature readings for the CPU and the System.

The following items will be displayed for your reference only:

CPU Temperature

The CPU thermal technology that reports absolute temperatures (Celsius/Fahrenheit) has been upgraded to a more advanced feature by Intel in its newer processors. The basic concept is each CPU is embedded by unique temperature information that the motherboard can read. This 'Temperature Threshold' or 'Temperature Tolerance' has been assigned at the factory and is the baseline on which the motherboard takes action during different CPU temperature conditions (i.e., by increasing CPU Fan speed, triggering the Overheat Alarm, etc). Since CPUs can have different 'Temperature Tolerances', the installed CPU can now send information to the motherboard what its 'Temperature Tolerance' is, and not the other way around. This results in better CPU thermal management.

Supermicro has leveraged this feature by assigning a temperature status to certain thermal conditions in the processor (Low, Medium and High). This makes it easier for the user to understand the CPU's temperature status, rather than by just simply seeing a temperature reading (i.e., 25°C). The CPU Temperature feature will display the CPU temperature status as detected by the BIOS:

Low – This level is considered as the 'normal' operating state. The CPU temperature is well below the CPU 'Temperature Tolerance'. The motherboard fans and CPU will run normally as configured in the BIOS (Fan Speed Control).

Medium – The processor is running warmer. This is a 'precautionary' level and generally means that there may be factors contributing to this condition, but the CPU is still within its normal operating state and below the CPU 'Temperature Tolerance'. The motherboard fans and CPU will run normally as configured in the BIOS. The fans may adjust to a faster speed depending on the Fan Speed Control settings.

User intervention: No action is required. However, consider checking the CPU fans and the chassis ventilation for blockage.

High – The processor is running hot. This is a 'caution' level since the CPU's 'Temperature Tolerance' has been reached (or has been exceeded) and may activate an overheat alarm.

User intervention: If the system buzzer and Overheat LED has activated, take action immediately by checking the system fans, chassis ventilation and room temperature to correct any problems.

Notes: 1. The system may shut down if it continues for a long period to prevent damage to the CPU.

2. The information provided above is for your reference only. For more information on thermal management, please refer to Intel's Web site at www.Intel.com.



System Temperature: The system temperature will be displayed (in degrees in Celsius and Fahrenheit) as it is detected by the BIOS.

Fan Speed Readings

This feature displays the fan speed readings from Fan1 through Fan3.

Fan Speed Control Modes

This feature allows the user to decide how the system controls the speeds of the onboard fans. The CPU temperature and the fan speed are correlative. When the CPU on-die temperature increases, the fan speed will also increase for effective system cooling. Select "Full Speed/FS" to allow the onboard fans to run at full speed for maximum cooling. The FS setting is recommended for special system configuration or debugging. Select "Performance/PF" for better system cooling. The PF setting is recommended for high-power-consuming and high-density systems.

Select "Balanced/BL" for the onboard fans to run at a speed that will balance the needs between system cooling and power saving. The BL setting is recommended for regular systems with normal hardware configurations. Select "Energy Saving/ES" for best power efficiency and maximum quietness. The Options are: **Full Speed/FS**, Performance/PF, Balanced/BL, and Energy Saving/ES.

Voltages Readings

The following voltage readings will be displayed.

CPU1 Vcore, CPU2 Vcore, +5V, +5VSB,+12V, CPU1 DIMM, CPU2 DIMM, +1.5V, 3.3V, +3.3VSB, and Vbatt.

►ACPI Configuration

Use this feature to configure Advanced Configuration and Power Interface (ACPI) power management settings for your system.

ACPI Version Features

The options are ACPI v1.0, **ACPI v2.0** and ACPI v3.0. Please refer to ACPI's website for further explanation: <http://www.acpi.info/>.

ACPI APIC Support

Select Enabled to include the ACPI APIC Table Pointer in the RSDT (Root System Description Table) pointer list. The options are **Enabled** and Disabled.

APIC ACPI SCI IRQ

When this item is set to Enabled, APIC ACPI SCI IRQ is supported by the system. The options are Enabled and **Disabled**.

Headless Mode

This feature is used to enable system to function without a keyboard, monitor or mouse attached. The options are Enabled and **Disabled**.

NUMA Support

Select Enabled to use the feature of Non-Uniform Memory Access to improve CPU performance. The options are Disabled, **Enabled** and NUMA for SLES 11.

High Performance Event Timer

Select Enabled to activate the High Performance Event Timer (HPET) that produces periodic interrupts at a much higher frequency than a Real-time Clock (RTC) does in synchronizing multimedia streams, providing smooth playback and reducing the de-

pendency on other timestamp calculation devices, such as an x86 RDTSC Instruction embedded in the CPU. The High Performance Event Timer is used to replace the 8254 Programmable Interval Timer. The options are Enabled and **Disabled**.

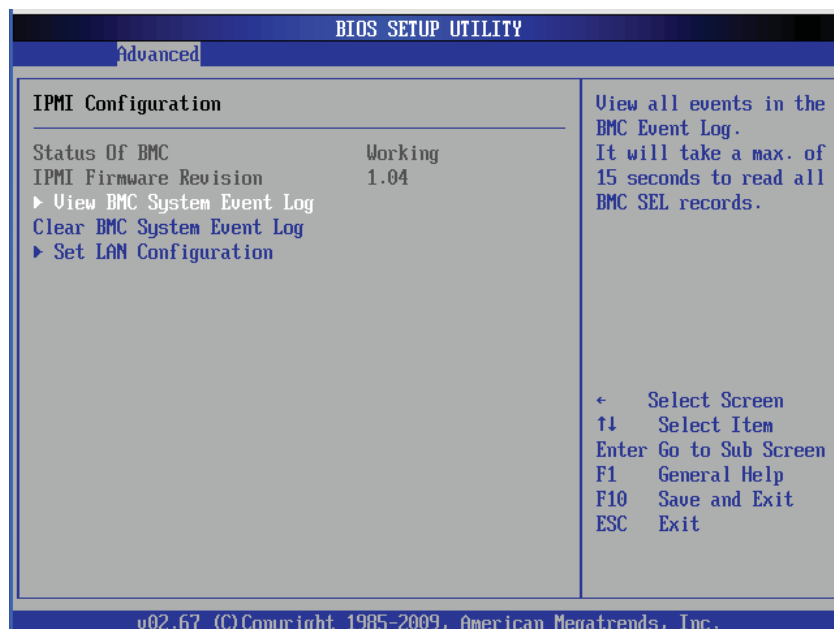
► General WHEA Configuration

WHEA Support

Select Enabled to enable Windows Hardware Error Architecture (WHEA) support which will provide a common infrastructure for handling hardware errors on Windows platforms in order to reduce system crashes due to hardware errors and improve system recovery and health monitoring. The default setting is **Enabled**.

► IPMI Configuration

Intelligent Platform Management Interface (IPMI) is a set of network interfaces used for system monitoring and management from a remote site. For details on IPMI, please visit Intel's website at www.intel.com.



Status of BMC

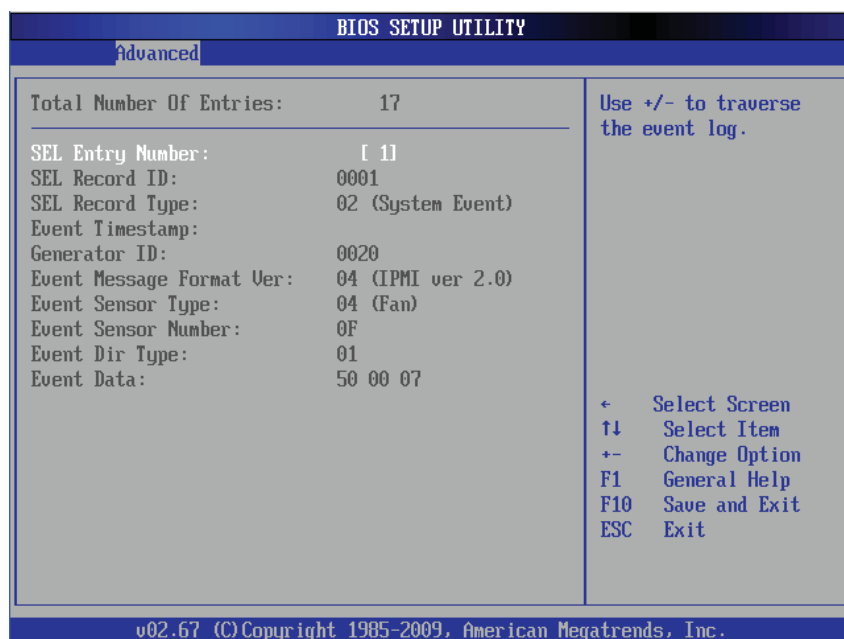
Baseboard Management Controller (BMC) manages the interface between system management software and platform hardware. This item display the status of the BMC micro controller.

IPMI Firmware Revision

This feature displays the IPMI Firmware Revision Number for your system.

►View BMC System Event Log

This feature displays the BMC System Event Log (SEL). It shows the total number of entries of BMC System Events. To view an event, select an Entry Number and pressing <Enter> to display the information as shown in the screen.



- Total Number of Entries
- SEL Entry Number
- SEL Record ID
- SEL Record Type
- Event Timestamp
- Generator ID
- Event Message Format Ver:
- Event Sensor Type
- Event Sensor Number,
- Event Dir Type
- Event Data.

Clear BMC System Event Log

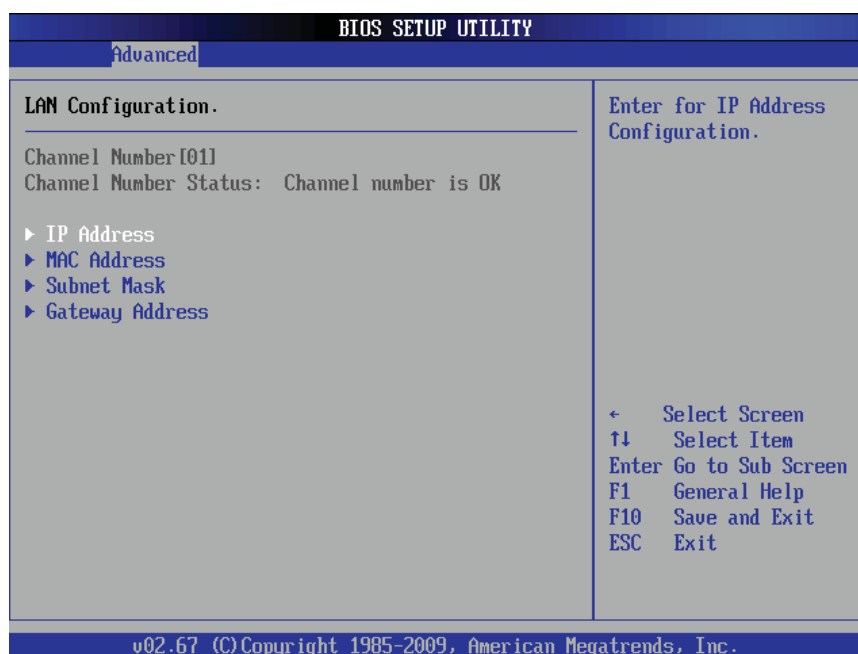
Select OK and press the <Enter> key to clear the BMC system log. Select Cancel to keep the BMC System log. The options are **OK** and Cancel.



Caution: Any cleared information is unrecoverable. Make absolutely sure that you no longer need any data stored in the log before clearing the BMC Event Log.

►Set LAN Configuration

Set this feature to configure the IPMI LAN adapter with a network address as shown in the following graphics.



Channel Number - Enter the channel number for the SET LAN Configuration command. This is initially set to **[1]**. Press <+> or <-> on your keyboard to change the Channel Number.

Channel Number Status - This feature returns the channel status for the Channel Number selected above: "Channel Number is OK" or "Wrong Channel Number".

►IP Address

Enter the IP address for this machine. This should be in decimal and in dotted quad form (i.e., 192.168.10.253). The value of each three-digit number separated by dots should not exceed 255 as shown in the screen below.

Parameter Selector

Use this feature to select the parameter of your IP Address configuration.

IP Address Source

This feature allows the user to select the source of the IP address for the system. If Static is selected, the user will need to manually enter the IP address for the system. If DHCP is selected, the BIOS will search for a DHCP (Dynamic Host Configuration Protocol) server in the network that the system is attached to, and request the next available IP address. The options are **DHCP** and Static. If Static is selected, the following items will be available for configuration.

IP Address

The BIOS will automatically enter the IP address of this machine; however it may be over-ridden. This should be in decimal and in dotted quad form (i.e., 192.168.10.253). The value of each three-digit number separated by dots should not exceed 255.

Current IP Address in BMC

This item displays the current IP address used for your IPMI connection.

►MAC Address

Enter the Mac address for this machine. MAC addresses are 6 two-digit hexadecimal numbers (Base 16, 0 ~ 9, A, B, C, D, E, F) separated by dots. (i.e., 00.30.48.D0.D4.60).

Parameter Selector

Use this feature to select the parameter of your Mac Address configuration.

Current Mac Address in BMC

This item displays the current Mac address used for your IPMI connection.

►Subnet Mask Configuration

Subnet masks tell the network which subnet this machine belongs to. The value of each three-digit number separated by dots should not exceed 255.

Parameter Selector

Use this feature to select the parameter of your Subnet Masks configuration.

Subnet Mask

This item displays the subnet mask setting for your IPMI connection.

Current Subnet Mask in BMC

This item displays the current subnet mask setting for your IPMI connection.

► Gateway Address Configuration

Enter the gateway address for this machine. This should be in decimal and in dotted quad form (i.e., 192.168.10.253). The value of each three-digit number separated by dots should not exceed 255 as shown in the screen below.

Parameter Selector

Use this feature to select the parameter of your Gateway Address settings.

Gateway Address

The BIOS will automatically enter the Gateway address of this machine; however it may be over-ridden. Gateway addresses are 4-decimal numbers in dotted quad form (i.e., 192.168.10.253). The value of each 3-digit number separated by dots should not exceed 255.

Current Gateway Address in BMC

This item displays the current Gateway address used for your IPMI connection.

► DMI Event Log

View Event Log

Use this option to view the System Event Log.

Mark all events as read

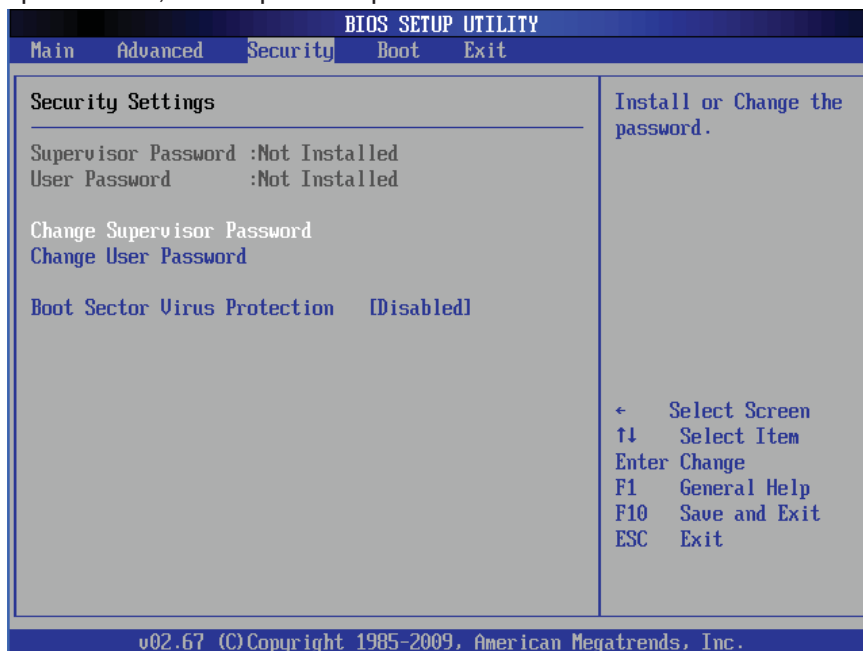
This option marks all events as read. The options are **OK** and **Cancel**.

Clear event log

This option clears the Event Log memory of all messages. The options are **OK** and **Cancel**.

7-4 Security Settings

The AMIBIOS Setup Utility provides a Supervisor and a User password. If you use both passwords, the Supervisor password must be set first.



Supervisor Password

This feature indicates if a supervisor's password has been entered (installed).

User Password

This feature indicates if a user's password has been entered (installed).

Change Supervisor Password

Select this item, press <Enter> to access the submenu and enter a supervisor password.

Change User Password

Select this item, press <Enter> to enter a user password.

Clear User Password (Available only when a User Password has been set)

This item allows you to clear a user password after it has been entered.

Password Check

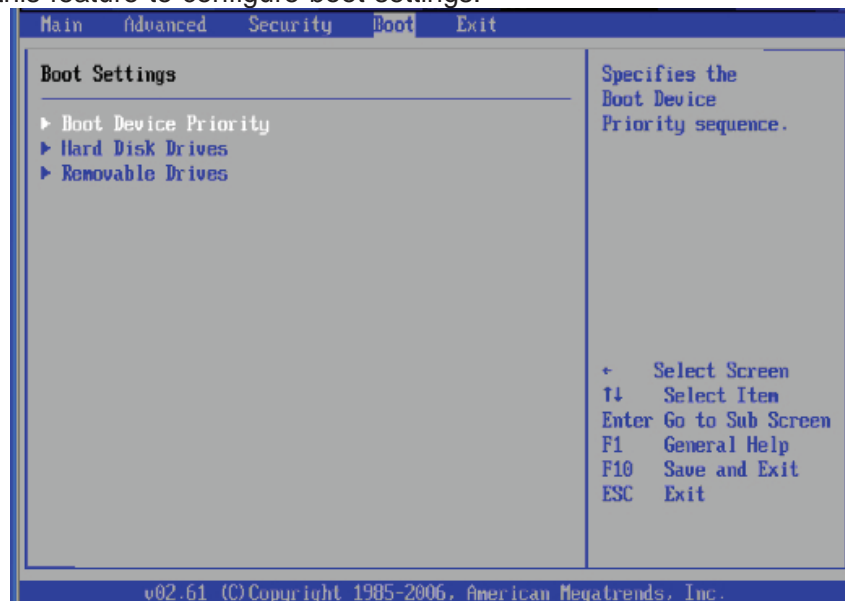
Select Setup for the system to check for a password at Setup. Select Always for the system to check for a password at bootup. The options are **Setup** and Always.

Boot Sector Virus Protection

When Enabled, the AMI BIOS displays a warning when any program (or virus) issues a Disk Format command or attempts to write to the boot sector of the hard disk drive. The options are Enabled and **Disabled**.

7-5 Boot Configuration

Use this feature to configure boot settings.



► Boot Device Priority

This feature allows the user to specify the sequence of priority for the Boot Device. The settings are available boot devices and Disabled.

- 1st Boot Device - [USB: XXXXXXXXXX]/2nd Boot Device - [CD/DVD: XXXXXXXXXX]

► Hard Disk Drives

This feature allows the user to specify the boot sequence from all available hard disk drives. The settings are Disabled and a list of all HDDs detected.

- 1st Drive - [SATA: XXXXXXXXXX]

► Removable Drives

This feature allows the user to specify the boot sequence from available Removable Drives. The settings are 1st boot device, 2nd boot device, and Disabled.

- 1st Drive - [USB: XXXXXXXXXX]/2nd Drive

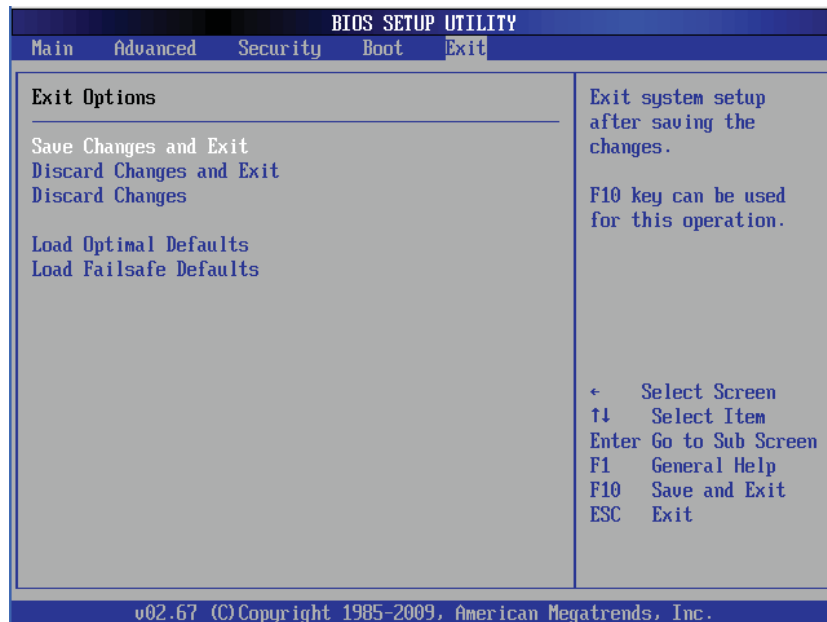
► CD/DVD Drives

This feature allows the user to specify the boot sequence from all available CD/DVD drives. The settings are Disabled, and a list of CD/DVD devices as detected.

- 1st Drive - [USB: XXXXXXXXXX]

7-6 Exit Options

Select the Exit tab from the AMI BIOS Utility to enter the Exit BIOS Setup screen.



Save Changes and Exit

When you have completed the system configuration changes, select this option to leave the BIOS Setup Utility and reboot the computer, so the new system configuration parameters can take effect. Select Save Changes and Exit from the Exit menu and press <Enter>.

Discard Changes and Exit

Select this option to quit the BIOS Setup without making any permanent changes to the system configuration, and reboot the computer. Select Discard Changes and Exit from the Exit menu and press <Enter>.

Discard Changes

Select this option and press <Enter> to discard all the changes and return to the AMI BIOS Utility Program.

Load Optimal Defaults

To set this feature, select Load Optimal Defaults from the Exit menu and press <Enter>. Then, select OK to allow the AMI BIOS to automatically load Optimal Defaults to the BIOS Settings. The Optimal settings are designed for maximum system performance, but may not work best for all computer applications.

Load Fail-Safe Defaults

To set this feature, select Load Fail-Safe Defaults from the Exit menu and press <Enter>. The Fail-Safe settings are designed for maximum system stability, but not for maximum performance.

Appendix A

BIOS Error Beep Codes

During the POST (Power-On Self-Test) routines, which are performed each time the system is powered on, errors may occur.

Non-fatal errors are those which, in most cases, allow the system to continue the boot-up process. The error messages normally appear on the screen.

Fatal errors are those which will not allow the system to continue the boot-up procedure. If a fatal error occurs, you should consult with your system manufacturer for possible repairs.

BIOS Error Beep Codes		
Beep Code	Error Message	Description
1 beep	Refresh	Circuits have been reset. (Ready to power up)
5 short beeps + 1 long beep	Memory error	No memory detected in the system
8 beeps	Display memory read/write error	Video adapter missing or with faulty memory
1 continuous beep (with the front panel OH LED on)	System Overheat	1 continuous beep with the front panel OH LED on

Notes

Appendix B

System Specifications

Processors (each node)

Single or dual Intel® Xeon 5500/5600 Series processors in LGA1336 type sockets (both CPUs must be of the same type)

Note: Please refer to our web site for a complete listing of supported processors.

Chipset

Intel 5520 chipset (5520/IOH-36D + ICH10)

BIOS

8 Mb Phoenix® SPI Flash ROM

Memory Capacity (each node)

Six DIMM slots that can support up to 48 GB of ECC registered DDR3-1333/1066/800 or up to 24 GB of ECC/non-ECC unbuffered DDR3-1333/1066/800 SDRAM

Note: see Section 5-6 for details.

SAS Controller (each node)

LSI 2008 SAS controller for SAS 2.0 (RAID 0, 1, 10 and 1E modes supported)

Drive Bays

Sixteen hot-swap drive bays to house 16 3.5" SAS drives

Expansion Slots

Two low-profile PCI Express 2.0 x16 slots (one on each serverboard)

Serverboard (two per system)

X8DTS-F (Proprietary form factor)

Dimensions: 16.64 x 8.1 in (423 x 206 mm)

Chassis

SC937ETS-R1200NDBP (3U rackmount)

Dimensions: (WxHxD) 17.2 x 5.2 x 24.2 in. (437 x 132 x 615 mm)

Weight (Net): 56 lbs. (25.5 kg.)

Weight

Gross (Bare Bone): 75 lbs. (34 kg.)

System Cooling

Three sets of 4-cm counter-rotating fans above each node, two sets of counter-rotating fans at the back of each node, one set of counter-rotating fans on each serverboard (each set contains two fans placed back-to-back)

System Input Requirements

AC Input Voltage: 100 - 240V AC auto-range

Rated Input Current: 11.5 - 5.5A max

Rated Input Frequency: 50 to 60 Hz

Power Supply

Rated Output Power: 1200W (Part# PWS-1K21P-1R) 80 Plus Gold Certified

Rated Output Voltages: +12V (100A @ 240V, 83A @ 100V), +5Vsb (6A @ 240V, 4A @ 100V)

Operating Environment

Operating Temperature: 10° to 35° C (50° to 95° F)

Non-operating Temperature: -40° to 70° C (-40° to 158° F)

Operating Relative Humidity: 20% to 95% (non-condensing)

Non-operating Relative Humidity: 5 to 95% (non-condensing)

Regulatory Compliance

Electromagnetic Emissions: FCC Class A, EN 55022 Class A, EN 61000-3-2/-3-3, CISPR 22 Class A

Electromagnetic Immunity: EN 55024/CISPR 24, (EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11)

Safety: CSA/EN/IEC/UL 60950-1 Compliant, UL or CSA Listed (USA and Canada), CE Marking (Europe)

California Best Management Practices Regulations for Perchlorate Materials:

This Perchlorate warning applies only to products containing CR (Manganese Dioxide) Lithium coin cells. "Perchlorate Material-special handling may apply. See www.dtsc.ca.gov/hazardouswaste/perchlorate"

Notes

(continued from front)

The products sold by Supermicro are not intended for and will not be used in life support systems, medical equipment, nuclear facilities or systems, aircraft, aircraft devices, aircraft/emergency communication devices or other critical systems whose failure to perform be reasonably expected to result in significant injury or loss of life or catastrophic property damage. Accordingly, Supermicro disclaims any and all liability, and should buyer use or sell such products for use in such ultra-hazardous applications, it does so entirely at its own risk. Furthermore, buyer agrees to fully indemnify, defend and hold Supermicro harmless for and against any and all claims, demands, actions, litigation, and proceedings of any kind arising out of or related to such ultra-hazardous use or sale.